SEW EURODRIVE

Assembly and Operating Instructions

Gear Unit Model Series R.., F.., K.., S.., SPIROPLAN® W..

Edition 08/2022

27784460/EN

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1 General information

1.1 About this documentation

The documentation at hand is the original.

This documentation is an integral part of the product. The documentation is intended for all employees who perform work on the product.

Make sure this documentation is accessible and legible. Ensure that persons responsible for the systems and their operation as well as persons who work on the product independently have read through the documentation carefully and understood it. If you are unclear about any of the information in this documentation or if you require further information, contact SEW-EURODRIVE.

1.2 Structure of the safety notes

1.2.1 Meaning of signal words

The following table shows the grading and meaning of the signal words for safety notes:

Signal word	Meaning	Consequences if disregarded
⚠ **DANGER**	Imminent hazard	Severe or fatal injuries
⚠ **WARNING**	Possible dangerous situation	Severe or fatal injuries
⚠ **CAUTION**	Possible dangerous situation	Minor injuries
NOTICE	Possible damage to property	Damage to the product or its environment
INFORMATION	Useful information or tip: Simplifies handling of the product.	

1.2.2 Structure of section-related safety notes

Section-related safety notes do not apply to a specific action but to several actions pertaining to one subject. The hazard symbols used either indicate a general hazard or a specific hazard.

This is the formal structure of a safety note for a specific section:

SIGNAL WORD

Type and source of hazard.

Possible consequence(s) if disregarded.

- Measure(s) to prevent the hazard.

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Meaning of the hazard symbols

The hazard symbols in the safety notes have the following meaning:

Hazard symbol	Meaning
	General hazard
	Warning of hot surfaces
	Warning of risk of crushing
	Warning of automatic restart

1.2.3 Structure of embedded safety notes

Embedded safety notes are directly integrated into the instructions just before the description of the dangerous action.

This is the formal structure of an embedded safety note:

⚠ **SIGNAL WORD!** Type and source of hazard. Possible consequence(s) if disregarded. Measure(s) to prevent the hazard.

1.3 Rights to claim under limited warranty

Read the information in this documentation. This is essential for fault-free operation and fulfillment of any rights to claim under limited warranty. Read the documentation before you start working with the product.

1.4 Product names and trademarks

The brands and product names in this documentation are trademarks or registered trademarks of their respective titleholders.

1.5 Copyright notice

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2 Safety notes

2.1 Preliminary information

The following general safety notes serve the purpose of preventing injury to persons and damage to property. They primarily apply to the use of products described in this documentation. If you use additional components, also observe the relevant warning and safety notes.

2.2 Duties of the user

As the user, you must ensure that the basic safety notes are observed and complied with. Make sure that persons responsible for the machinery and its operation as well as persons who work on the device independently have read through the documentation carefully and understood it.

As the user, you must ensure that all of the work listed in the following is carried out only by qualified specialists:

- Setup and installation
- Installation and connection
- Startup
- Maintenance and repairs
- Shutdown
- Disassembly

Ensure that the persons who work on the product pay attention to the following regulations, conditions, documentation, and information:

- National and regional safety and accident prevention regulations
- Warning and safety signs on the product
- All other relevant project planning documents, installation and startup instructions, and wiring diagrams
- Do not assemble, install or operate damaged products
- All system-specific specifications and conditions

Ensure that systems in which the product is installed are equipped with additional monitoring and protection devices. Observe the applicable safety regulations and legislation governing technical work equipment and accident prevention regulations.

2.3 Target group

Specialist for mechanical work

Any mechanical work may be performed only by adequately qualified specialists. Specialists in the context of this documentation are persons who are familiar with the design, mechanical installation, troubleshooting, and maintenance of the product who possess the following qualifications:

- Qualifications in the field of mechanics in accordance with the national regulations
- Familiarity with this documentation

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Specialist for electrotechnical work

Any electrotechnical work may be performed only by electrically skilled persons with a suitable education. Electrically skilled persons in the context of this documentation are persons who are familiar with electrical installation, startup, troubleshooting, and maintenance of the product who possess the following qualifications:

- Qualifications in the field of electrical engineering in accordance with the national regulations
- Familiarity with this documentation

Additional qualifications

In addition to that, these persons must be familiar with the valid safety regulations and laws, as well as with the requirements of the standards, directives, and laws specified in this documentation.

The persons must have the express authorization of the company to operate, program, parameterize, label, and ground devices, systems, and circuits in accordance with the standards of safety technology.

Instructed persons

All work in the areas of transport, storage, installation, operation and waste disposal may only be carried out by persons who are trained and instructed appropriately. These instructions must enable the persons to carry out the required activities and work steps safely and in accordance with regulations.

2.4 Designated use

The product is intended for use in industrial and commercial systems.

In case of installation in electrical systems or machines, startup of the product is prohibited until it is determined that the machine meets the requirements stipulated in the local laws and directives. For Europe, Machinery Directive 2006/42/EC as well as the EMC Directive 2014/30/EU apply.

Use in potentially explosive atmospheres is prohibited, unless specifically designated otherwise.

2.5 Transportation/storage

Inspect the shipment for damage as soon as you receive the delivery. Inform the shipping company immediately about any damage. If the product is damaged, it must not be assembled, installed or started up.

Observe the storage information on climatic conditions as given in chapter "Storage conditions for long-term storage" (→ 🗎 186).

If the product is not immediately installed, it must be stored in a dry and dust-free location. The product can be stored for up to 9 months without requiring any special measures before startup. Do not store the product outdoors.

The permissible storage temperature is -30 °C to +50 °C.

For storage periods longer than 9 months, SEW-EURODRIVE recommends the "Extended storage" design. For further information, refer to chapter "Extended storage" (→ 🗎 186)

The installed lifting eyebolts are in accordance with DIN 580. Observe the loads and regulations specified there. The tension force vector of the slings must not exceed a 45° angle in accordance with DIN 580.

If the product has several lifting eyes or lifting eyebolts, then you should use all lifting eyes and lifting eyebolts for attaching transport ropes. Tighten lifting eyebolts. The lifting eyes or lifting eyebolts are designed to carry only the weight of the product. Do not apply any additional loads.

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The gear units K..167 and K..187 have no lifting eyes and are supplied without lifting eyebolts. Use alternative, suitable slings.

Do not store the gearmotor on the fan guard.

Use suitable, sufficiently rated and reusable handling equipment.

2.6 Installation/assembly

Ensure that the product is installed and cooled according to the regulations in the documentation.

Protect the product from strong mechanical strain. The product and its mounting parts must never protrude into the path of persons or vehicles. Ensure that components are not deformed, particularly during transportation and handling. Electrical components must not be mechanically damaged or destroyed.

The following applications are prohibited unless the device is explicitly designed for such use:

- Operation in applications with impermissibly high mechanical vibration and shock loads in excess of the regulations stipulated in EN 61800-5-1
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, radiation, etc.

Before using a stainless steel shrink disk or stainless steel output shaft, check if the ambient conditions are compatible with the stainless steel material. For information on the material, refer to the order confirmation.

2.7 Startup/operation

Check the oil level before startup as described in chapter "Inspection/maintenance" (→ 🗎 123).

Check that the direction of rotation is correct in the **decoupled** state. Listen out for unusual grinding noises as the shaft rotates.

Secure the keys for the test run without output elements.

Do not deactivate monitoring and protection devices even for a test run.

Switch off the gearmotor if in doubt whenever changes occur in relation to normal operation (e.g. increased temperatures, unusual noises, vibrations). Determine the cause. It may be necessary to contact SEW-EURODRIVE.

2.8 Cleaning

When using a stainless steel shrink disk or stainless steel output shaft, check if the cleaning agents and chemicals are compatible with the stainless steel material. For information on the material, refer to the order confirmation.

2.9 Inspection/maintenance

Observe the information in chapter "Inspection/maintenance" (→ 🗎 123).

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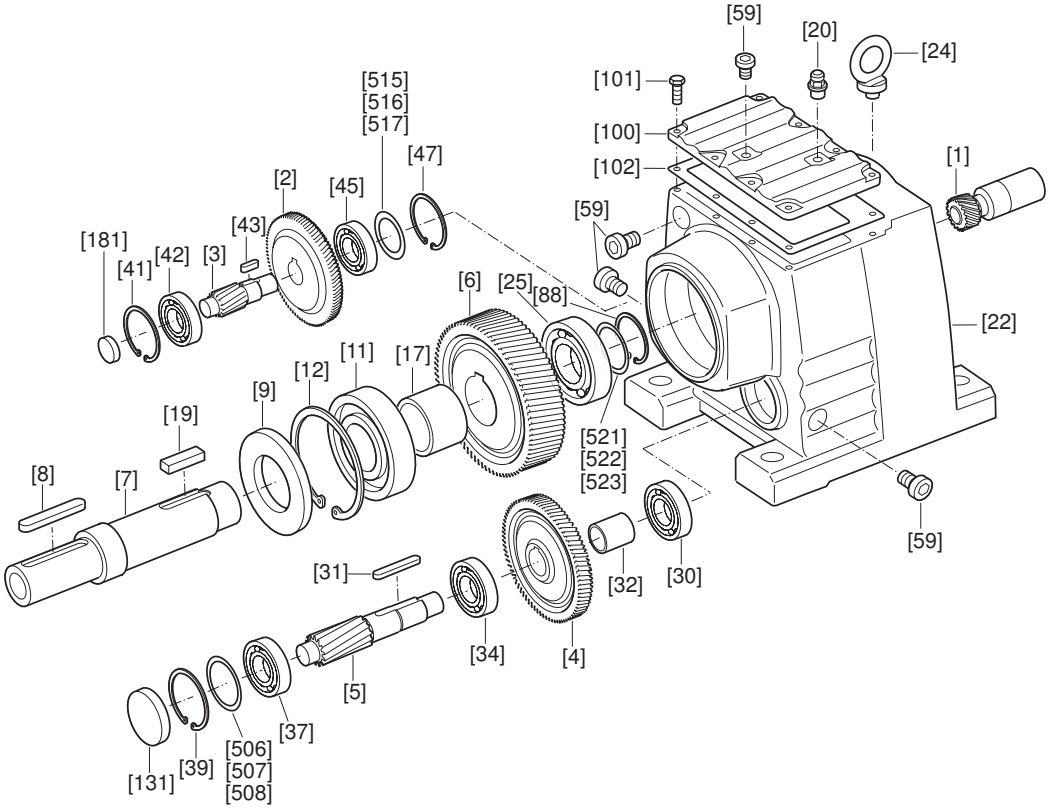
3 Gear unit structure

INFORMATION

The following figures are block diagrams. Their purpose is only to make it easier to assign components to the spare parts lists. Discrepancies may occur depending on the gear unit size and version.

3.1 Basic structure of helical gear units R..07 – R..167



18014398528676235

[1] Pinion
[2] Gear
[3] Pinion shaft
[4] Gear
[5] Pinion shaft
[6] Gear
[7] Output shaft
[8] Key
[9] Oil seal
[11] Rolling bearing
[12] Retaining ring
[17] Spacer tube
[19] Key
[20] Breather valve
[22] Gear unit housing
[24] Eyebolt
[25] Rolling bearing
[30] Rolling bearing
[31] Key
[32] Spacer tube
[34] Rolling bearing
[37] Rolling bearing
[39] Retaining ring
[41] Retaining ring
[42] Rolling bearing
[43] Key
[45] Rolling bearing
[47] Retaining ring
[59] Screw plug
[88] Retaining ring
[100] Inspection cover
[101] Hex head screw
[102] Gasket
[131] Closing cap
[181] Closing cap
[506] Shim
[507] Shim
[508] Shim
[515] Shim
[516] Shim
[517] Shim
[521] Shim
[522] Shim
[523] Shim

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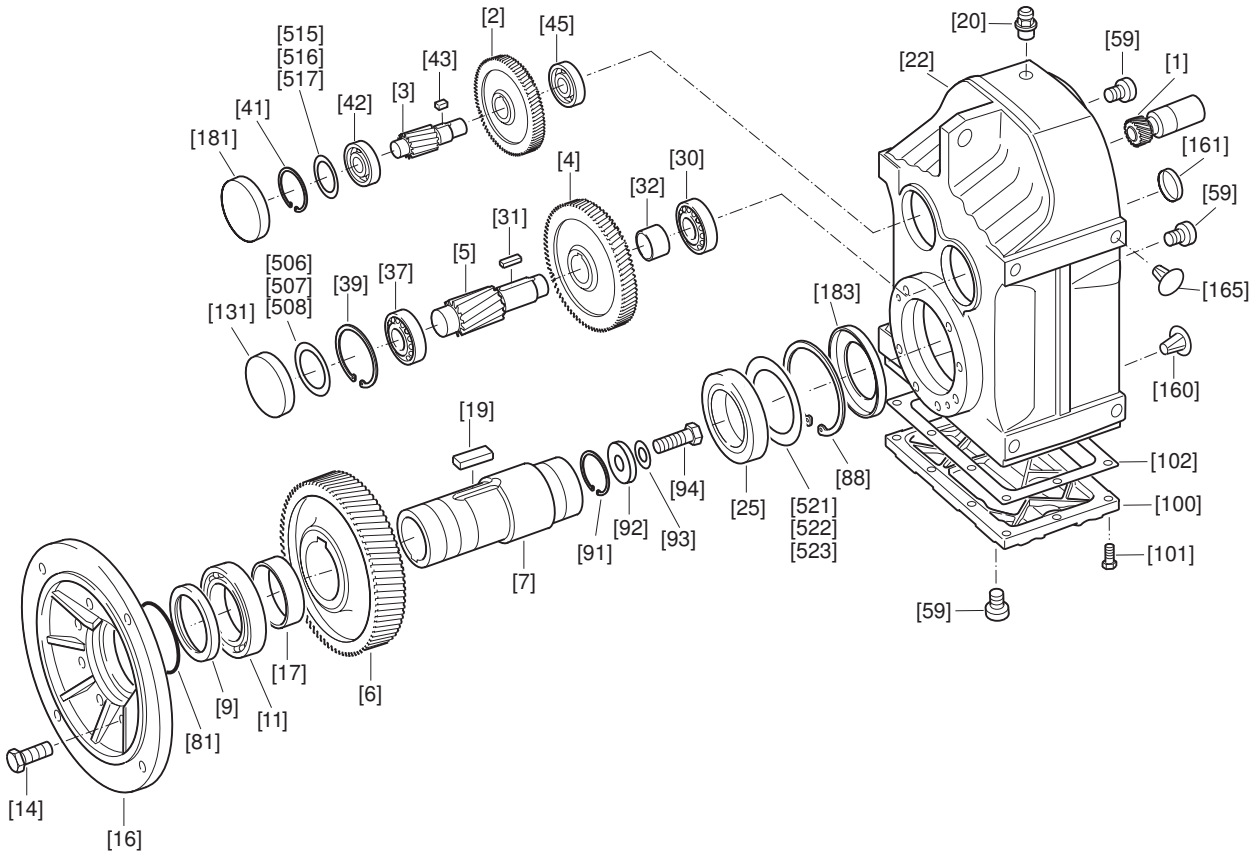
3.2 Basic structure of parallel-shaft helical gear units F..27 – F..157



9007199274039051

[1] Pinion
[2] Gear
[3] Pinion shaft
[4] Gear
[5] Pinion shaft
[6] Gear
[7] Hollow shaft
[9] Oil seal
[11] Rolling bearing
[14] Hex head screw
[16] Output flange
[17] Spacer tube
[19] Key
[20] Breather valve
[22] Gear unit housing
[25] Rolling bearing
[30] Rolling bearing
[31] Key
[32] Spacer tube
[37] Rolling bearing
[39] Retaining ring
[41] Retaining ring
[42] Rolling bearing
[43] Key
[45] Rolling bearing
[59] Screw plug
[81] Shield ring
[88] Retaining ring
[91] Retaining ring
[92] Washer
[93] Lock washer
[94] Hex head screw
[100] Inspection cover
[101] Hex head screw
[102] Gasket
[131] Closing cap
[160] Closing plug
[161] Closing cap
[165] Closing plug
[181] Closing cap
[183] Oil seal
[506] Shim
[507] Shim
[508] Shim
[515] Shim
[516] Shim
[517] Shim
[521] Shim
[522] Shim
[523] Shim

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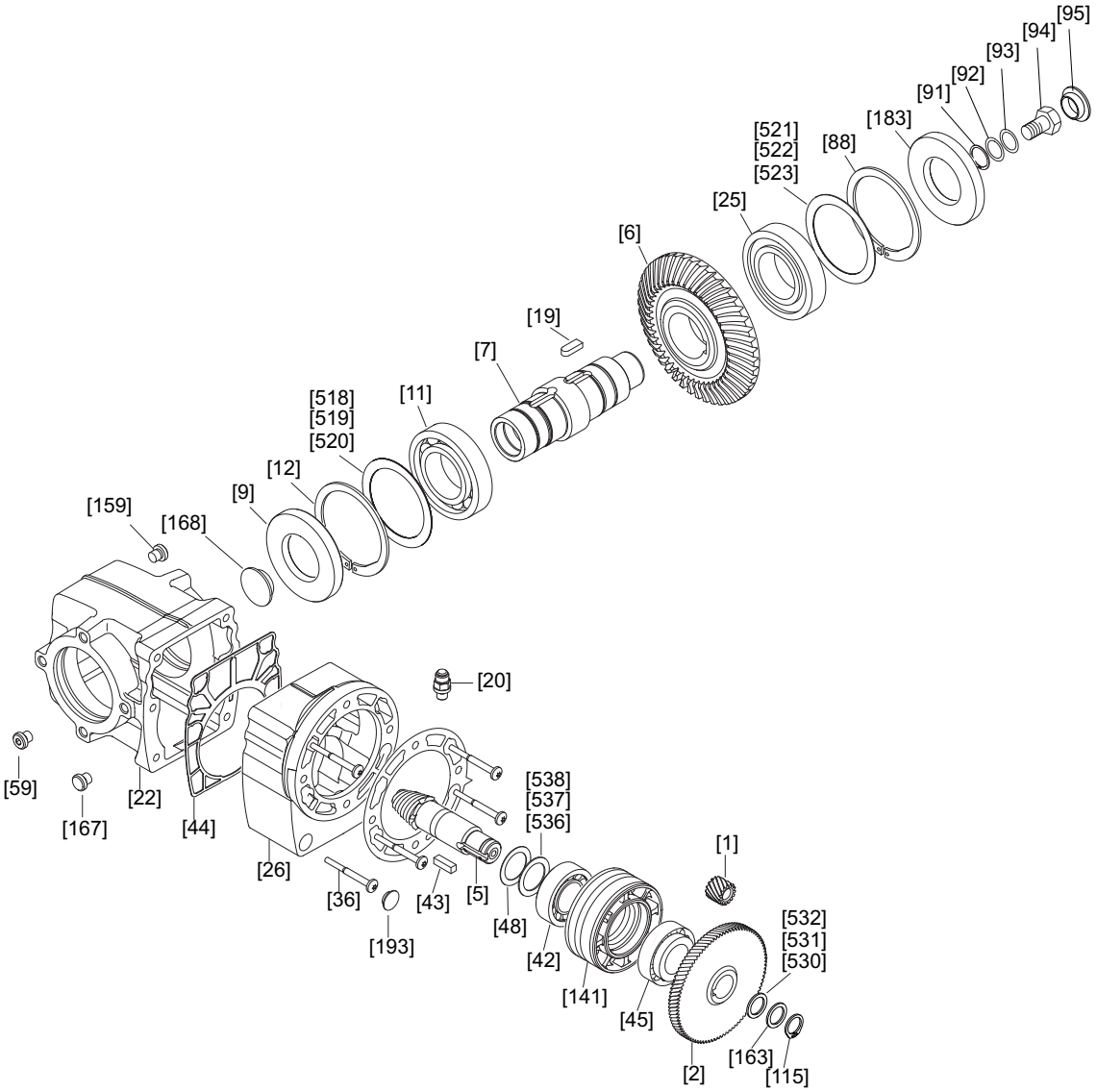
3.3 Basic structure of helical-bevel gear units K..19/K..29



18014405931092491

[1]	Pinion	[26]	Housing of 1st stage	[94]	Hex head screw	[520]	Shim
[2]	Gear	[36]	Stud	[95]	Protection cap	[521]	Shim
[5]	Pinion shaft	[42]	Tapered roller bearing	[115]	Retaining ring	[522]	Shim
[6]	Gear	[43]	Key	[141]	Bushing	[523]	Shim
[7]	Hollow shaft	[44]	Seal	[159]	Closing plug	[530]	Shim
[9]	Oil seal	[45]	Tapered roller bearing	[163]	Supporting ring	[531]	Shim
[11]	Rolling bearing	[50]	Bevel gear set	[167]	Closing plug	[532]	Shim
[12]	Retaining ring	[59]	Screw plug	[168]	Protection cap	[536]	Shim
[19]	Key	[88]	Retaining ring	[183]	Oil seal	[537]	Shim
[20]	Breather valve	[91]	Retaining ring	[193]	Closing plug	[538]	Shim
[22]	Gear unit housing	[92]	Washer	[518]	Shim		
[25]	Deep groove ball bearing	[93]	Lock washer	[519]	Shim		

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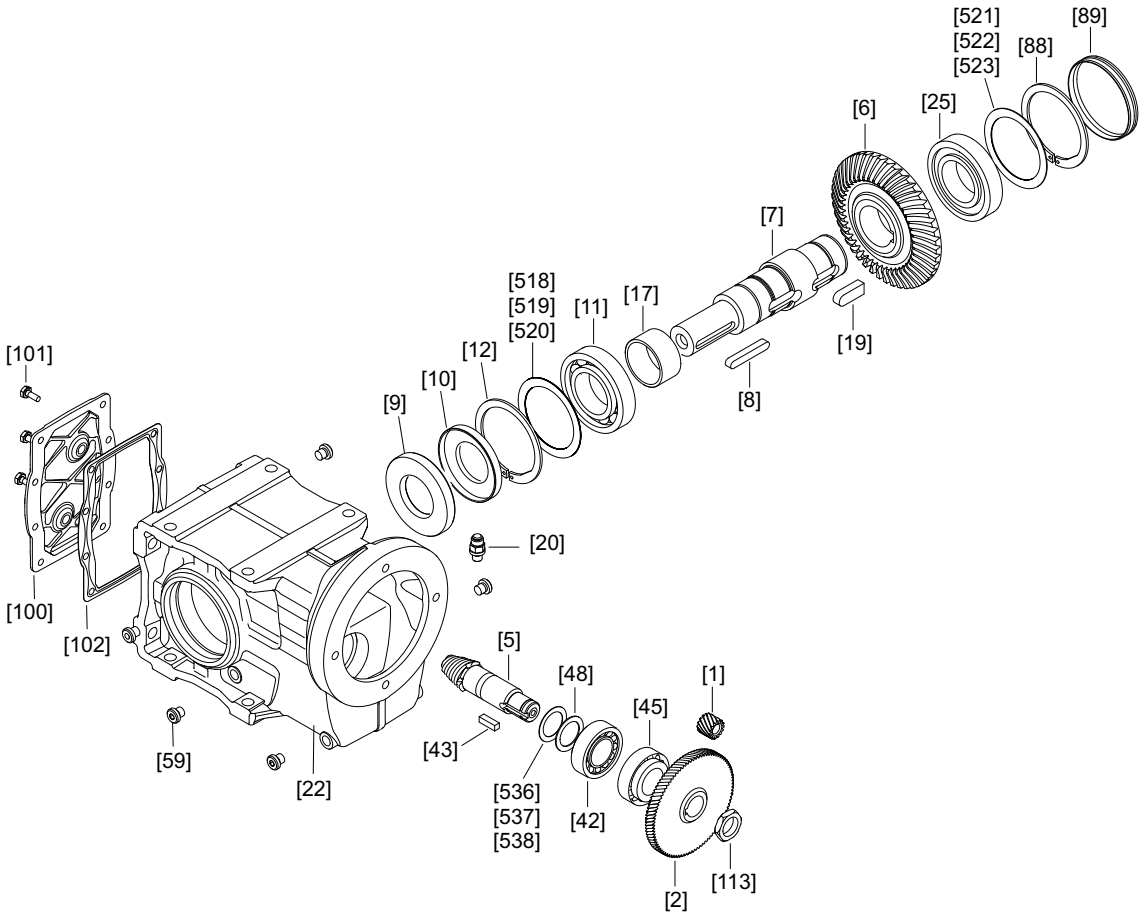
3.4 Basic structure of helical-bevel gear units K..39/K..49



14457456395

[1]	Pinion	[12]	Retaining ring	[48]	Supporting ring	[518]	Shim
[2]	Gear	[17]	Spacer tube	[50]	Bevel gear set	[519]	Shim
[5]	Pinion shaft	[19]	Key	[59]	Screw plug	[520]	Shim
[6]	Gear	[20]	Breather valve	[88]	Retaining ring	[521]	Shim
[7]	Hollow shaft	[22]	Gear unit housing	[89]	Closing cap	[522]	Shim
[8]	Key	[25]	Deep groove ball bearing	[100]	Inspection cover	[523]	Shim
[9]	Oil seal	[42]	Tapered roller bearing	[101]	Hex head screw	[536]	Shim
[10]	Oil seal	[43]	Key	[102]	Gasket	[537]	Shim
[11]	Deep groove ball bearing	[45]	Tapered roller bearing	[113]	Slotted nut	[538]	Shim

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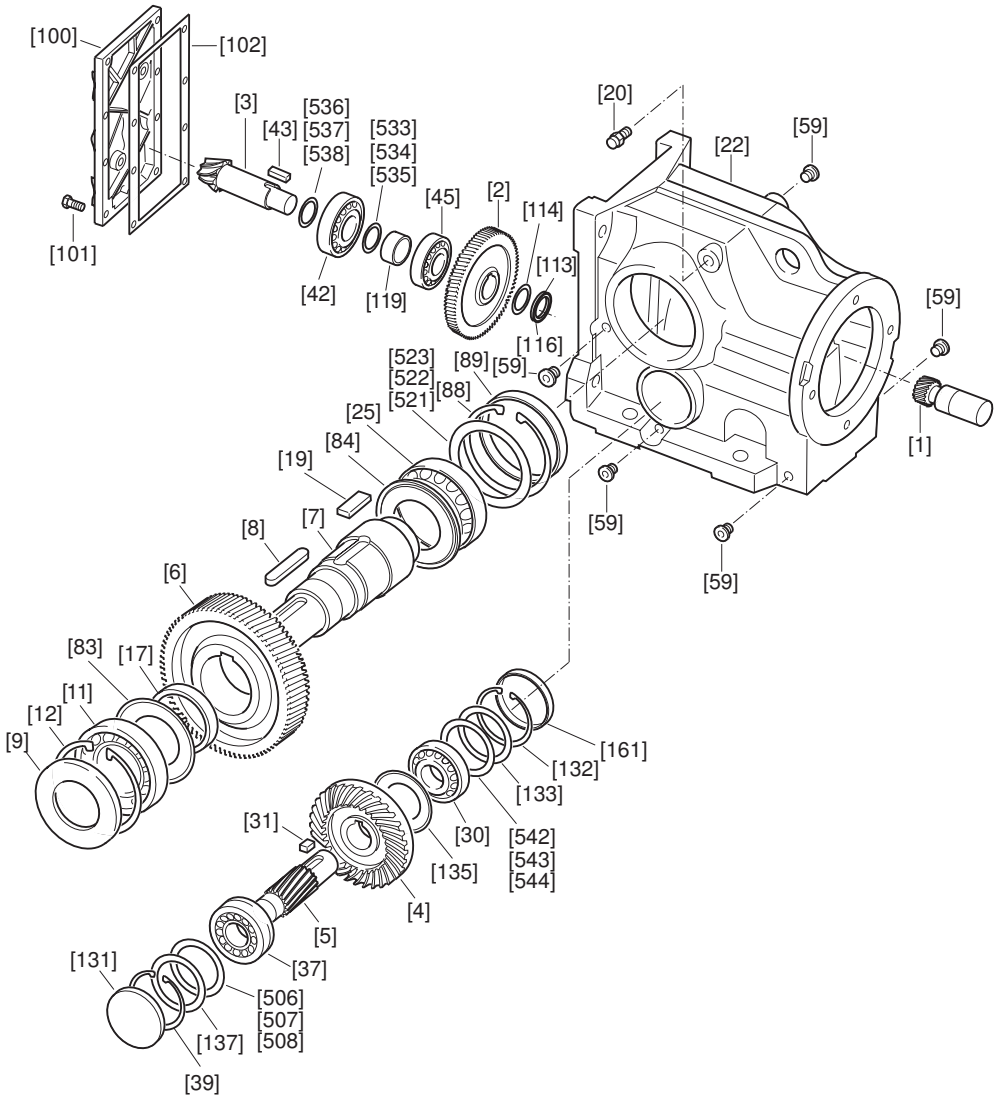
3.5 Basic structure of helical-bevel gear units K..37 – K..187



9007199274042123

[1] Pinion
[2] Gear
[3] Pinion shaft
[4] Gear
[5] Pinion shaft
[6] Gear
[7] Output shaft
[8] Key
[9] Oil seal
[11] Rolling bearing
[12] Retaining ring
[17] Spacer tube
[19] Key
[20] Breather valve
[22] Gear unit housing
[25] Rolling bearing
[30] Rolling bearing
[31] Key
[37] Rolling bearing
[39] Retaining ring
[42] Rolling bearing
[43] Key
[45] Rolling bearing
[59] Screw plug
[83] Shield ring
[84] Shield ring
[88] Retaining ring
[89] Closing cap
[100] Inspection cover
[101] Hex head screw
[102] Gasket
[113] Slotted nut
[114] Multi-tang washer
[116] Thread lock
[119] Spacer tube
[131] Closing cap
[132] Retaining ring
[133] Supporting ring
[135] Shield ring
[137] Supporting ring
[161] Closing cap
[506] Shim
[507] Shim
[508] Shim
[521] Shim
[522] Shim
[523] Shim
[533] Shim
[534] Shim
[535] Shim
[536] Shim
[537] Shim
[538] Shim
[542] Shim
[543] Shim
[544] Shim

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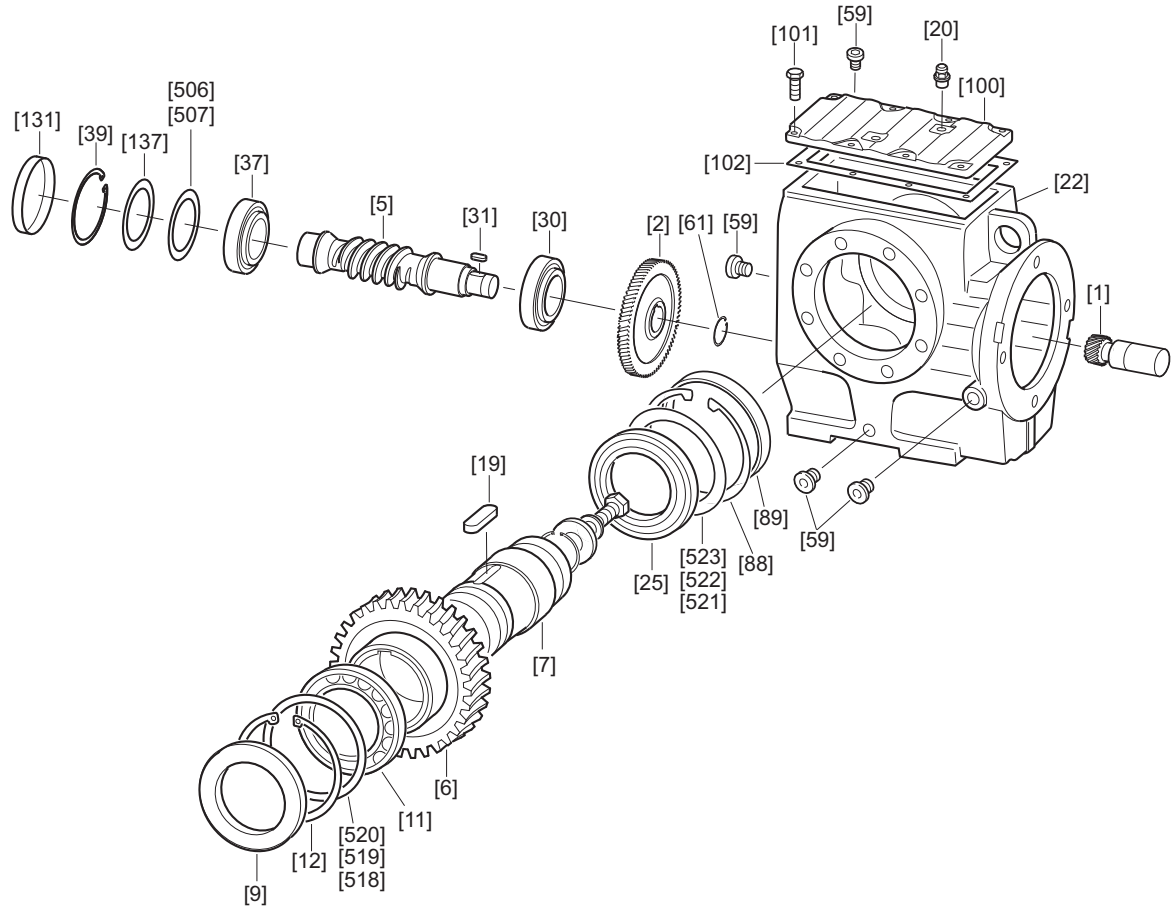
3.6 Basic structure of helical-worm gear units S..37 – S..97, S..37p – S..97p



18014398528786187

[1]	Pinion	[20]	Breather valve	[88]	Retaining ring	[518]	Shim
[2]	Gear	[22]	Gear unit housing	[89]	Closing cap	[519]	Shim
[5]	Worm	[25]	Rolling bearings	[100]	Gear unit cover	[520]	Shim
[6]	Worm gear	[30]	Rolling bearings	[101]	Hex head screw	[521]	Shim
[7]	Output shaft	[31]	Key	[102]	Gasket	[522]	Shim
[9]	Oil seal	[37]	Rolling bearings	[131]	Closing cap	[523]	Shim
[11]	Rolling bearings	[39]	Retaining ring	[137]	Supporting ring		
[12]	Retaining ring	[59]	Screw plug	[506]	Shim		
[19]	Key	[61]	Retaining ring	[507]	Shim		

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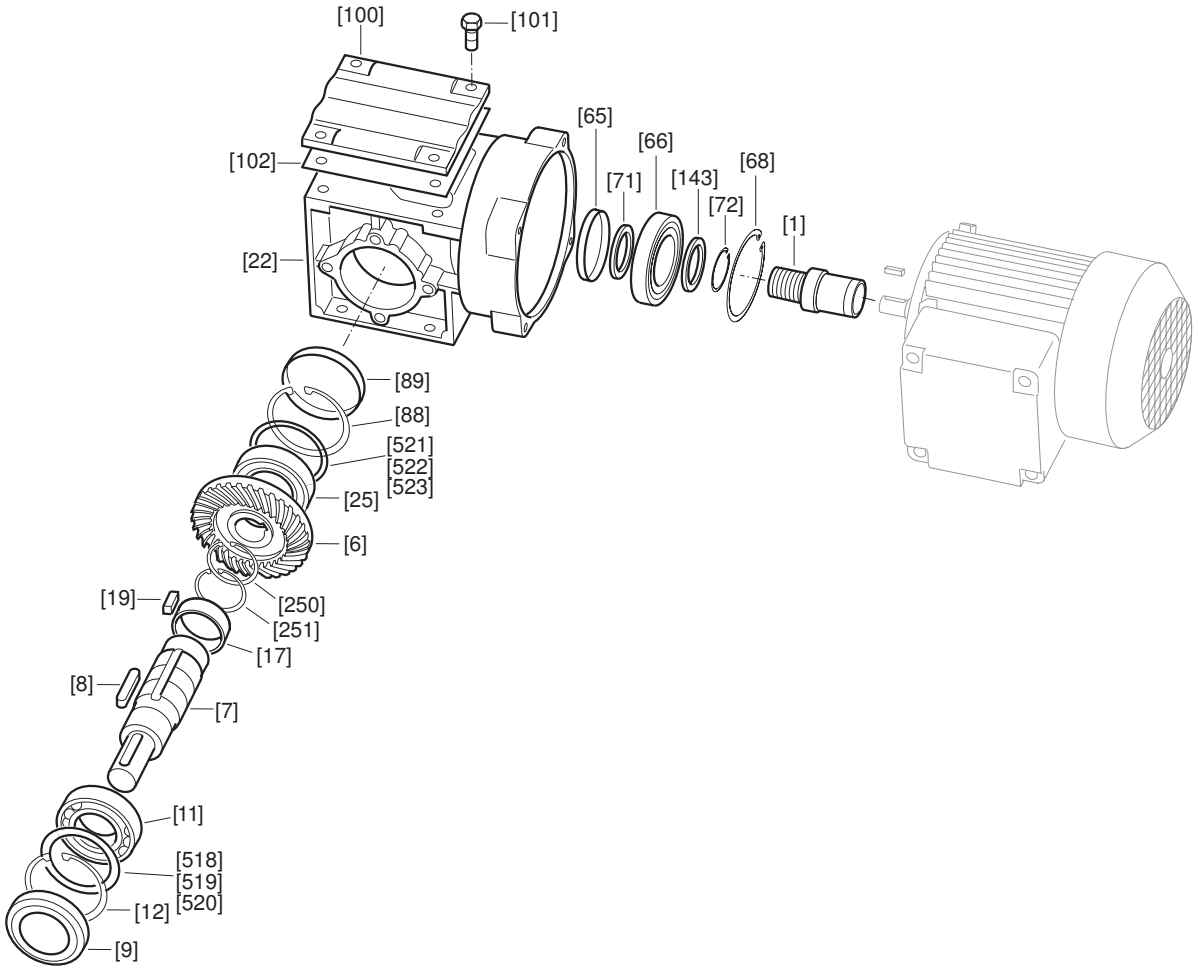
3.7 Basic structure of SPIROPLAN® gear units W..10 – W..30



9007199274048267

[1] Pinion
[6] Gear
[7] Output shaft
[8] Key
[9] Oil seal
[11] Rolling bearing
[12] Retaining ring
[17] Spacer tube
[19] Key
[22] Gear unit housing
[25] Rolling bearing
[65] Oil seal
[66] Rolling bearing
[68] Retaining ring
[71] Supporting ring
[72] Retaining ring
[88] Retaining ring
[89] Closing cap
[100] Inspection cover
[101] Hex head screw
[102] Gasket
[143] Supporting ring
[250] Retaining ring
[251] Retaining ring
[518] Shim
[519] Shim
[520] Shim
[521] Shim
[522] Shim
[523] Shim

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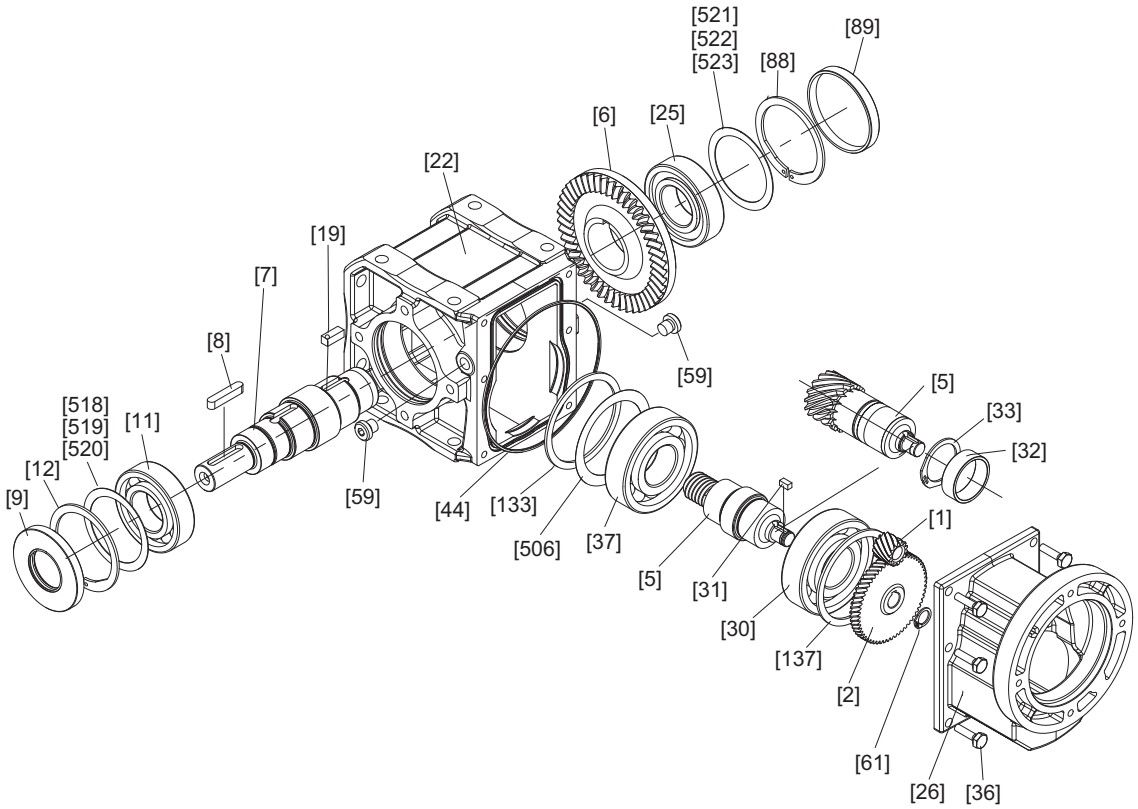
3.8 Basic structure of SPIROPLAN® gear units W..37/W..47



18014399115354379

[1]	Pinion	[22]	Gear unit housing	[59]	Screw plug	[521]	Shim
[2]	Wheel	[25]	Deep groove ball bearing	[61]	Retaining ring	[522]	Shim
[5]	Pinion shaft	[26]	Housing stage 1	[88]	Retaining ring	[523]	Shim
[6]	Wheel	[30]	Deep groove ball bearing	[89]	Closing cap		
[7]	Output shaft	[31]	Key	[133]	Shim		
[8]	Key	[32]	Spacer tube	[137]	Shim		
[9]	Oil seal	[33]	Retaining ring	[506]	Shim		
[11]	Deep groove ball bearing	[36]	Hex head screw	[518]	Shim		
[12]	Retaining ring	[37]	Deep groove ball bearing	[519]	Shim		
[19]	Key	[44]	O-ring	[520]	Shim		

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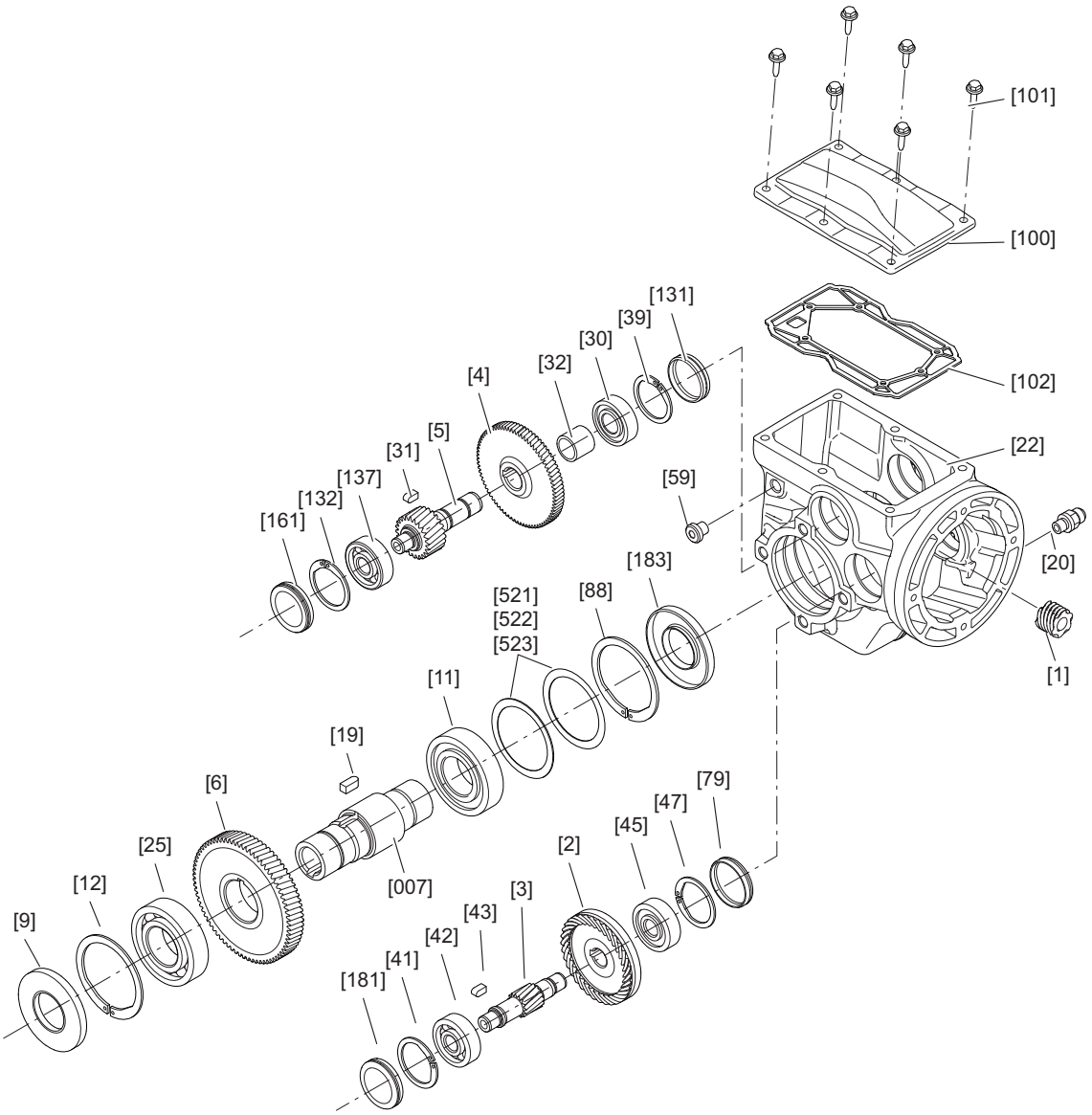
3.9 Basic structure of SPIROPLAN® W..19 to W..59 gear units



[1]	Pinion	[22]	Gear unit housing	[79]	Closing cap	[522]	Shim
[2]	Gear wheel	[25]	Deep groove ball bearing	[88]	Retaining ring	[523]	Shim
[3]	Pinion shaft	[30]	Deep groove ball bearing	[100]	Gear unit cover		
[4]	Gear wheel	[31]	Key	[101]	Hex head screw		
[5]	Pinion shaft	[32]	Spacer tube	[102]	Gasket		
[6]	Gear wheel	[39]	Retaining ring	[131]	Closing cap		
[7]	Input shaft	[41]	Retaining ring	[132]	Retaining ring		
[9]	Oil seal	[42]	Deep groove ball bearing	[137]	Deep groove ball bearing		
[11]	Deep groove ball bearing	[43]	Key	[161]	Closing cap		
[12]	Retaining ring	[45]	Deep groove ball bearing	[181]	Closing cap		
[19]	Key	[47]	Retaining ring	[183]	Oil seal		
[20]	Breather valve	[59]	Screw plug	[521]	Shim		

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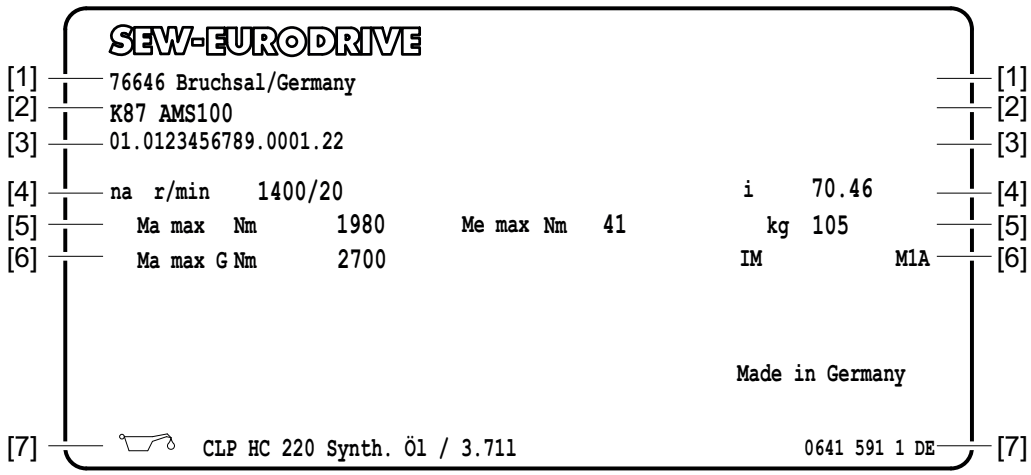
3.10 Nameplate/type designation

3.10.1 Gear unit nameplates

The following figures show examples of nameplates for a helical-bevel gear unit with input adapter:

Nameplate 1



[1] • Manufacturer, address
[2] • Type designation
[3] • Serial number
[4] • Input speed / output speed
• Gear ratio
[5] • Maximum permitted output torque of the gear unit / adapter combination
• Maximum permitted input torque
• Weight
[6] • Maximum permitted output torque of the open gear unit without additional component
• Mounting position
[7] • Oil type and oil fill volume

Explanation of the production number:

01.	0123456789.	0001.	22
Sales Organization	Order number	Item number	Year of manufacture

Nameplate 2

	Product label with QR code. The QR code can be scanned. You will be redirected to the digital services of SEW-EURODRIVE. There, you have access to product-specific data, documents, and additional services.

3.10.2 Type designation of the gear unit

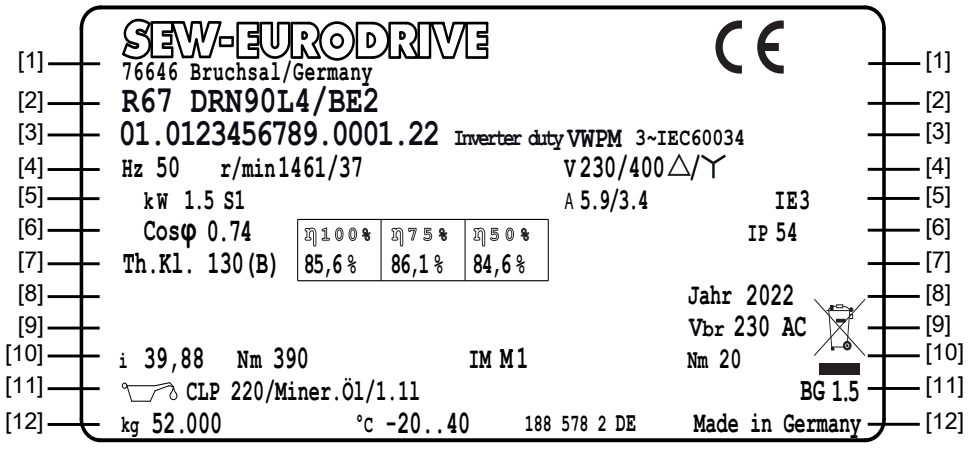
A helical-bevel gear unit with AQA adapter, for example, has the following type designation:

Example: K37/R AQSA 80 /1		
Gear unit type	**K**	Helical-bevel gear units
Gear unit size	**37**	19 – 49; 37 – 187
Option	**/R**	E.g. option /R: reduced rotational clearance
Adapter	**AQSA**	E.g. adapter for mounting servomotors: AQSA: Adapter with keyway AQSH: Adapter with clamping ring hub
Adapter size	**80**	
Variants	**/1**	

3.10.3 DRN.. gearmotor nameplates

The following figures show examples of the nameplates of a DRN.. gearmotor.

Nameplate 1



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Line	Information
[1]	• Manufacturer, address, CE mark
[2]	• Type designation
[3]	• Serial number • Suitability for inverter operation • Number of phases and underlying rating and performance standard
[4]	• Rated frequency • Rated speed of the motor / speed of the gear unit output shaft • Nominal voltage

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Line	Information
[5]	• Rated power and operating mode • Rated current • Energy efficiency class according to IEC 60034-30-1
[6]	• Power factor • Efficiency after capacity utilization of 100%, 75%, and 50% • Degree of protection according to IEC 60034-5
[7]	• Thermal class
[8]	• Year of manufacture
[9]	• Brake voltage • Waste disposal according to WEEE Directive
[10]	• Gear unit ratio • Output torque • Mounting position • Nominal braking torque
[11]	• Oil type and oil fill volume • Brake control
[12]	• Gearmotor weight • Permitted ambient temperature of the motor • Nameplate number • Country of manufacture

Nameplate 2

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The QR code on the product gives you quick access to the digital services from SEW-EURODRIVE.

In addition to being able to enter the QR code with the camera of your mobile device or an appropriate app, you can also use the "Product ID Plus" app from SEW-EURODRIVE. After scanning, you will see the technical data to identify the product directly.

In addition, the search for product-specific spare parts and documentation, as well as fault diagnostics and direct service requests are simple and fast.

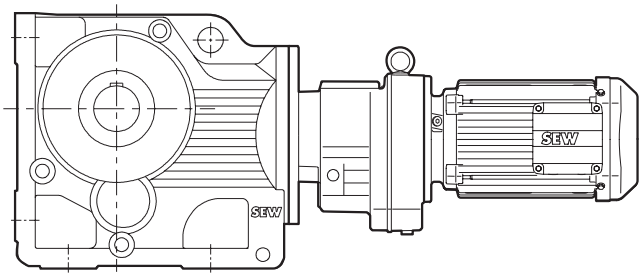
3.10.4 Type designation of a DRN.. gearmotor

The type designation of the gearmotor starts from the component on the output end.

For instance, a multi-stage helical-bevel gearmotor with temperature sensor in the motor winding has the following type designation:

Example: K107R77 DRN100LS4 /TF		
Gear unit type	K	1st gear unit
Size	107	
Gear unit type	R	2nd gear unit
Size	77	
Motor series	DR	Motor
Product line	N	
Size	100LS	
Number of poles	4	
Motor option temperature sensor	/TF	Option

Example: DRN.. gearmotor



K107 R77 DRN100LS4/TF

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3.11 Designs and options – R.., F.., K.., S.., W.. gear units

Below, there is an overview of type designations for R.., F.., K.., S.., and W.. gear units and their options.

3.11.1 Helical gear units

Designation	Description
RX..	Single-stage foot-mounted design, output shaft with key
RXF..	Single-stage B5 flange-mounted design, output shaft with key
R..	Foot-mounted design, output shaft with key
R..F	Foot- and B5 flange-mounted design, output shaft with key
RF..	B5 flange-mounted design, output shaft with key
RZ..	B14 flange-mounted design, output shaft with key
RM..	B5 flange-mounted design with extended bearing hub, output shaft with key

3.11.2 Parallel-shaft helical gear units

Designation	Description
F..	Foot-mounted design, output shaft with key
FA..B	Foot-mounted design, hollow shaft with keyway
FH..B	Foot-mounted design, hollow shaft with shrink disk
FV..B	Foot-mounted design, splined hollow shaft to DIN 5480
FF..	B5 flange-mounted design, output shaft with key
FAF..	B5 flange-mounted design, hollow shaft with keyway
FHF..	B5 flange-mounted design, hollow shaft with shrink disk
FVF..	B5 flange-mounted design, splined hollow shaft to DIN 5480
FA..	Hollow shaft with keyway
FH..	Hollow shaft with shrink disk
FT..	Hollow shaft with TorqLOC® hollow shaft mounting system
FV..	Splined hollow shaft to DIN 5480
FZ..	B14 flange-mounted design, output shaft with key
FAZ..	B14 flange-mounted design, hollow shaft with keyway
FHZ..	B14 flange-mounted design, hollow shaft with shrink disk
FVZ..	B14 flange-mounted design, splined hollow shaft to DIN 5480
FM..	B5 flange-mounted design with extended bearing hub, output shaft with key
FAM..	B5 flange-mounted design with extended bearing hub, hollow shaft with keyway

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3.11.3 Helical-bevel gear units

Designation	
K..	Foot-mounted design, output shaft with key
KA..B	Foot-mounted design, hollow shaft with keyway
KAF..B	B5 flange-mounted design, foot-mounted design, hollow shaft with keyway
KF..B	B5 flange-mounted design, foot-mounted design, output shaft with key
KH..B	Foot-mounted design, hollow shaft with shrink disk
KHF..B	B5 flange-mounted design, foot-mounted design, hollow shaft with shrink disk
KV..B	Foot-mounted design, splined hollow shaft to DIN 5480
KF..	B5 flange-mounted design, output shaft with key
KAF..	B5 flange-mounted design, hollow shaft with keyway
KHF..	B5 flange-mounted design, hollow shaft with shrink disk
KVF..	B5 flange-mounted design, splined hollow shaft to DIN 5480
KA..	Hollow shaft with keyway
KH..	Hollow shaft with shrink disk
KT..	Hollow shaft with TorqLOC® hollow shaft mounting system
KV..	Splined hollow shaft according to DIN 5480
KZ..	B14 flange-mounted design, output shaft with key
KAZ..	B14 flange-mounted design, hollow shaft with keyway
KHZ..	B14 flange-mounted design, hollow shaft with shrink disk
KVZ..	B14 flange-mounted design, splined hollow shaft to DIN 5480
KM..	B5 flange-mounted design with extended bearing hub, output shaft with key
KAM..	B5 flange-mounted design with extended bearing hub, hollow shaft with keyway

3.11.4 Helical-worm gear units

Designation	Description
S..	Foot-mounted design, output shaft with key
SF..	B5 flange-mounted design, output shaft with key
SAF..	B5 flange-mounted design and hollow shaft with keyway
SHF..	B5 flange-mounted design and hollow shaft with shrink disk
SA..	Hollow shaft with keyway
SH..	Hollow shaft with shrink disk
ST..	Hollow shaft with TorqLOC® hollow shaft mounting system
SAZ..	B14 flange-mounted design and hollow shaft with keyway

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Designation	Description
SHZ..	B14 flange-mounted design and hollow shaft with shrink disk

3.11.5 SPIROPLAN® gear units

Designation	Description
W..	Foot-mounted design, output shaft with key
WF..	B5 flange-mounted design, output shaft with key
WAF..	B5 flange-mounted design and hollow shaft with keyway
WA..	Hollow shaft with keyway
WHF..	B5 flange-mounted design and hollow shaft with shrink disk
WH..	Hollow shaft with shrink disk
WT..	Hollow shaft with TorqLOC® hollow shaft mounting system

3.11.6 Options

R, F, and K..7 gear units:

Designation	Description
/R	Reduced backlash

K, S and W gear units:

Designation	Description
/T	With torque arm

F gear units:

Designation	Description
/G	With rubber buffer

3.11.7 Condition monitoring

Designation	Description
/DUO	Diagnostic Unit Oil = Oil aging sensor
/DUV40A	Diagnostic Unit Vibration = Vibration sensor

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4 Mechanical installation

4.1 Installation requirements

NOTICE

Damage to the gear unit/gearmotor due to improper installation.

Damage to property.

- Observe the following information.

Make sure that the following requirements are met before you start installing the unit:

- The drive has not been damaged during transportation or storage.
- The entries on the nameplate of the gearmotor match the voltage supply system.
- In the case of abrasive ambient conditions, the output-end oil seals must be protected against wear.
- Output shafts and flange surfaces must be completely free from anti-corrosion agent and any kind of pollution. Use a commercially available solvent to clean the flange surfaces. Note that solvent damages the oil seal ring. Do not let the solvent come into contact with the sealing lips of the oil seal!
- **For standard drives:**
  - Check if the gear unit/gearmotor is designed for the ambient temperature. For the application limits, refer to the technical documentation, the nameplate, or the lubricant table (see chapter "Lubricant table" (→ 🗎 189)).
  - Make sure the environment contains no hazardous substances (oils, acids, gases, vapors, dusts, etc.) or radiation.
- **For special designs:**
  - Check if the gear unit/gearmotor is designed for the ambient temperature. You can find the application limits on the nameplate.
- **With helical-worm gear units / SPIROPLAN® W..0 gear units:**
  - Note that no large external mass moments of inertia which could exert a retrodriving load on the gear unit must be present.
  - Note the self-locking at η' (retrodriving) < 0.5.

    Calculation of η':η' = 2 - 1/η
- **Servomotor mounting:**
  - The drive may only be mounted if it is ensured that after the mounting the drive will be sufficiently ventilated. Ventilation prevents heat build-up.

4.1.1 Required tools/resources

The following tools and resources are required for the mechanical installation:

- Wrench
- Torque wrench for:
  - Gear unit mounting
  - Shrink disks
  - AQSH or EWH motor adapter
  - Input shaft assembly with centering shoulder

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- Mounting device
- Compensation elements (shims and spacing rings)
- Fasteners for input and output elements
- Lubricant (e.g. NOCO® fluid)
- Thread locking compound for input shaft assembly with centering shoulder (e.g. Loctite 243®)

INFORMATION

Standard parts are not included in the delivery.

4.1.2 Installation tolerances

Shaft end	Flanges
Diameter tolerance according to DIN 748 • ISO k6 for solid shafts with Ø ≤ 50 mm • ISO m6 for solid shafts with Ø > 50 mm • ISO H7 for hollow shafts • Centering bore according to DIN 332, shape DR	Centering shoulder tolerance to DIN EN 50347 • ISO j6 with N ≤ 250 mm • ISO h6 with N > 250 mm

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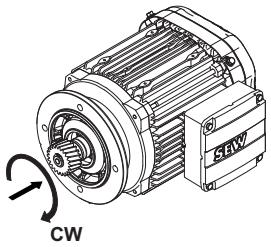
4.2 Directions of rotation

4.2.1 Direction of rotation of the motor shaft

In accordance with the standard IEC 60034-8 defined as standard:

Clockwise (CW) direction of rotation when looking onto the pinion shaft end of the motor.

Prerequisite: Connection U1-V1-W1



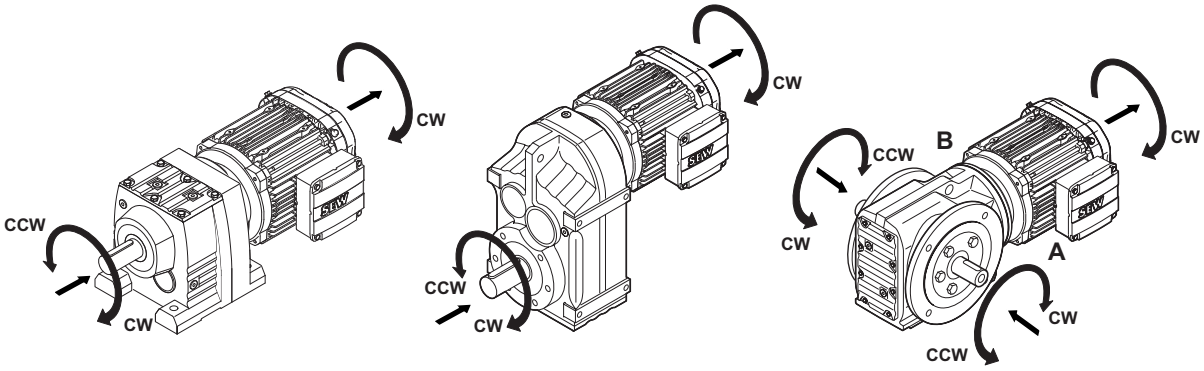
4.2.2 Direction of rotation of the output shaft

The standard direction of rotation when looking onto the output shaft of the gear unit:

- CW (clockwise)

  Clockwise direction of rotation
- CCW (counterclockwise)

  Counterclockwise direction of rotation



4.2.3 Direction of rotation of the gear unit

INFORMATION

Shaft position A, B, or AB (shaft output at both ends) is possible for K.. helical-bevel gear units, S.. helical-worm gear units, and SPIROPLAN® W gear units.

The direction of rotation is indicated according to the shaft position when looking onto the output end A or B or onto A and B respectively.

Series	Size	Gear unit stages	Shaft position	Standard direction of rotation when looking onto the output shaft[1)]
RX..	57 – 107	1		CCW

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Series	Size	Gear unit stages	Shaft position	Standard direction of rotation when looking onto the output shaft[1)]
R..	07 – 167	2		CW
		3		CCW
F..	27 – 157	2		CW
		3		CCW

1) CW = clockwise; CCW = counterclockwise.

Series	Size	Gear unit stages	Shaft position	Standard direction of rotation when looking onto the output shaft[1)]	
				View of output end A	View of output end B
K..	19 – 49	2	A	CW	
			AB	CW	CCW
			B		CCW
K..	37 – 187	3	A	CCW	
			AB	CCW	CW
			B		CCW
S..	37 – 97	2	A	CW	
			AB	CW	CCW
			B		CCW
W..	10 – 30	1	A	CCW	
			AB	CCW	CW
			B		CW
W..	19 – 59	2	A	CW	
			AB	CW	CCW
			B		CCW
		3	A	CCW	
			AB	CCW	CW
			B		CW

1) CW = clockwise; CCW = counterclockwise.

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4.3 Installing the gear unit

⚠ CAUTION

Risk of injury due to improper installation/disassembly.

Severe injury and damage to property.

- Work on the gear unit only when the machine is in an idle state.
- Secure the drive unit against unintentional power-up.
- Attach an information sign near the ON switch to warn that the gear unit is being worked on.
- Prevent heavy component parts (e.g. shrink disks) against falling during installation/disassembly.

⚠ CAUTION

Risk of injury due to protruding gear unit parts.

Severe injury.

- Keep a sufficient safety distance from the gear unit/gearmotor.

⚠ CAUTION

Danger due to static overdetermination if gear units with foot housing (e.g. KA19/29B, KA127/157B or FA127/157B) are mounted via both the torque arm and the foot plate.

Risk of injuries and damage to property.

- The simultaneous use of the foot plates and the torque arm, especially for the KA.9B/T version, is not permitted.
- Attach the KA.9B/T design only via the torque arm.
- Attach the K.9 or KA.9B design only via the foot plate.
- Contact SEW-EURODRIVE if you want to use feet and a torque arm for mounting.

⚠ CAUTION

Danger due to static overdetermination in the case of gearmotors when the gear unit is attached to the foot plate (e.g. KA19/29B, KA127/157B or FA127/157B, R-gear unit with foot-mounted motor) and the motor is attached to the foot plate as well.

Risk of injuries and damage to property.

- Attach only the gear unit or only the motor to the foot plate.

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⚠ CAUTION

Health hazard due to dangerous gases, vapors and residue created by heating fluorocarbon rubber to > 200 °C.

Damage to health.

The following gear unit components may contain fluorocarbon rubber: Oil seals, breather valves, screw plugs.

- Make sure that components made of fluorocarbon rubber are not exposed to thermal loads > 200 °C. Remove the components, if necessary.
- Avoid inhaling fluorocarbon rubber gases and vapors as well as skin and eye contact.
- Also avoid contact with cooled fluorocarbon rubber, as dangerous residues form when exposed to a thermal load.

NOTICE

Damage to the gear unit due to cold air currents. Condensed water in the gear unit can cause damage.

Damage to property.

- Protect the gear unit from direct cold air currents.

INFORMATION

When installing the gear unit, make sure that the oil level and drain plugs as well as the breather valves are easily accessible.

Mounting position

It is only permitted to install the gear unit or gearmotor in the specified mounting position. Observe the information on the nameplate. SPIROPLAN® gear units of sizes W10 to W30 are mounting position-independent.

Oil level

Check the mounting position-dependent oil level, refer to chapter "Inspection/maintenance of the gear unit" (→ 🗎 129). The gear units are filled with the required oil quantity at the factory. There may be slight deviations at the oil level plug as a result of the mounting position, which are permitted within the manufacturing tolerances.

Adjust the lubricant fill quantities and the position of the breather valve accordingly in the event of a change of mounting position. Observe chapter "Lubricant fill quantities" (→ 🗎 205) and chapter "Mounting positions" (→ 🗎 145).

Contact SEW-EURODRIVE in case of the following mounting position changes:

- Mounting position change to M4: Depending on the operating mode of the drive, an oil expansion tank can be necessary (see chapter "Oil expansion tank" (→ 🗎 108)).
- Changing the mounting position of K gear units to M5 or M6 or within these mounting positions
- Changing the mounting position of size S47 to S97 S gear units to mounting positions M2 and M3
- Changing the mounting positions of R gear units to mounting position M2.

Submounting

The support structure must have the following characteristics:

- Level
- Vibration damping
- Torsionally rigid

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The following table shows the maximally permitted flatness defect for foot and flange-mounting (guide values based on DIN ISO 1101):

Gear unit size	Flatness defect
≤ 67	Max. 0.4 mm
77 to 107	Max. 0.5 mm
137/147	Max. 0.7 mm
157 to 187	Max. 0.8 mm

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Foot- and flange-mounting

Do not twist housing legs and mounting flanges against each other.

Permitted overhung and axial loads

Observe the permitted overhung and axial loads. For the calculation of the permitted overhung and axial loads, refer to chapter "Configuration" in the gear unit or gearmotor catalog.

Strength class of the screws

Always mount gearmotors using screws of strength class 8.8. The gearmotors in flange-mounted design and in foot/flange-mounted design listed in the following table are an exception. Always use screws of strength class 10.9 for these gearmotors. Use suitable washers.

Gear unit	Flange Ø mm	Strength class of the screws
RF37/R37F SF37p	120	10.9
RF47/R47F	140	
RF57/R57F	160	
SF67p	200	
FF/FAF77 KF/KAF77 SF77p	250	
FM/FAM67, FM/FAM77 KM/KAM67, KM/KAM77	300	
FM/FAM87 KM/KAM87 SF87p	350	
FM/FAM97 KM/KAM97	400	
RF147 FM/FAM107 KM/KAM107	450	
RF167 FM/FAM127 KM/KAM127	550	
FM/FAM157 KM/KAM157	660	
RZ37 to RZ87	60ZR to 130ZR	

Corrosion protection for screw connections

Use plastic inserts (2 to 3 mm thick) if there is a risk of electrochemical corrosion between the gear unit and the driven machine. The material used must have an electrical leakage resistance < 10^9 Ω. Electrochemical corrosion can occur between various metals, for example, cast iron and stainless steel. Also install the screws with plastic washers. Additionally ground the housing. Use grounding screws on the motor.

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4.3.1 Notes concerning tightening torques

The tightening torques specified in the following chapters are based on the following friction coefficients:

Friction coefficient $\mu_{G,K}$ for thread and head contact surface	Strength class of screw
0.14	8.8 / 80[1)]
0.09	10.9, 12.9

1) Stainless steel screws.

If screws with a different friction coefficient are used, the tightening torques must be adapted accordingly.

Only use one of the following tools to tighten the screws:

- Torque wrench
- Torque-controlled torque wrench
- Impulse driver, switched off and controlled mechanically
- Torque wrench with light and sound signal
- Motorized screwdriver with dynamic torque measurement
- Torque-controlled, gradual hydraulic tools

4.3.2 Tightening torques for retaining screws

Screw the gearmotors with the following tightening torques and observe the information in chapter "Notes concerning tightening torques" (→ 🗎 34):

Screw/nut	Tightening torque ±15% Strength class 8.8 Nm
M6	12
M8	28
M10	56
M12	96
M16	235
M20	460
M24	795
M30	1590
M36	2760
M42	4410
M48	6650
M56	10600

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Screw the specified gearmotors with flange-mounted design with the following increased tightening torques and observe the information in chapter "Notes concerning tightening torques" (→ 🗎 34):

Ø flange mm	Gear unit	Screw/nut	Tightening torque ±15% Strength class 10.9 Nm
120	RF37 SF37p	M6	12
140	RF37/RF47	M8	29
160	RF57	M8	29
200	SF67p	M10	57
250	SF77p	M12	98
300	FM/FAM67, FM/FAM77 KM/KAM67, KM/KAM77	M12	98
350	FM/FAM87 KM/KAM87 SF87p	M16	235
400	FM/FAM97 KM/KAM97	M16	235
450	FM/FAM107 KM/KAM107	M16	235
450	RF147	M16	235
550	FM/FAM127 KM/KAM127	M16	235
550	RF167	M16	235
660	FM/FAM157 KM/KAM157	M20	465
60ZR	RZ37	M8	29
70ZR	RZ47	M8	29
80ZR	RZ57	M10	57
95ZR	RZ67	M10	57
110ZR	RZ77	M10	57
130ZR	RZ87	M12	98
250	FF77/KF77/ FAF77/ KAF77	M12	98

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4.3.3 Tightening torques for oil level plugs, oil drain plugs, screw plugs, breather valves and oil sight glasses

Observe the tightening torques specified in the following table when screwing:

Thread	Tightening torque Nm
M8 × 1	8
M10 × 1	12
M12 × 1.5	15
M16 × 1.5	40
M22 × 1.5	60
M33 × 2	100
M42 × 2	150

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4.3.4 Installing the gear unit

INFORMATION

If you use the gear unit in flange-mounted design or foot/flange-mounted design in connection with VARIBLOC® variable-speed gear units, use screws of 10.9 quality and suitable washers for flange mounting on the customer side.

To improve the friction contact between flange and mounting surface, SEW-EURODRIVE recommends anaerobic gaskets or an anaerobic glue.

INFORMATION

With the gear units KAZ/KZ/FAZ/FZ 107 – 157, remove the 4 transport protection screws from the B14 flange. The 2 recessed screws **must** remain in the B14 flange.

Foot-mounted gear units

The following table shows the thread sizes of the foot-mounted gear units depending on the gear unit type and size:

Screw	Gear unit type					
	R/R..F	RX	F/FH..B/ FA..B	K/KH..B/KV..B/ KA..B	S	W
M6	07	–	–	19	–	10/20
M8	17/27/37	–	27/37	29	37	30/37/47
M10	–	57	47	37/39/47/49	47/57	–
M12	47/57/67	67	57/67	57/67	67	–
M16	77/87	77/87	77/87	77	77	–
M20	97	97/107	97	87	87	–
M24	107	–	107	97	97	–
M30	127/137	–	127	107/167	–	–
M36	147/167	–	157	127/157/187	–	–

Gear unit with B14 flange-mounted design and/or hollow shaft

The following table shows the thread sizes of the gear units with B14 flange and/or hollow shaft depending on the gear unit type and size:

Screw	Gear unit type				
	RZ	FZ/FAZ/FHZ/ FVZ	KZ/KAZ/KHZ/ KVZ	SA/SAZ/SHZ	WA
M6	07/17/27	–	–	37	10/20/30[1)]
M8	37/47	27/37/47	37/47	47/57	37
M10	57/67	–	–	–	47
M12	77/87	57/67/77	57/67/77	67/77	–
M16	–	87/97	87/97	87/97	–
M20	–	107/127	107/127	–	–

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Screw	Gear unit type				
	RZ	FZ/FAZ/FHZ/ FVZ	KZ/KAZ/KHZ/ KVZ	SA/SAZ/SHZ	WA
M24	–	157	157	–	–

1) For the W30 design mounted directly on a CMP.. motor or mounted via an EWH.. adapter, the thread size is M8.

Gear units with B5 flange-mounted design

The following table shows the thread sizes of the gear units with B5 flange depending on the gear unit type, size and flange diameter:

Flange Ø mm	Screw	Gear unit type						
		RF/R..F/RM	RXF	FF/FAF/ FHF/ FVF	FM/FAM KM/ KAM	KF/KAF/ KHF/ KVF	SF/SAF/ SHF	WF/WAF/ WHF
80	M6	–	–	–	–	–	–	10
110	M8	–	–	–	–	–	–	20
120	M6	07/17/27	–	–	–	–	37	10/20/30/37
120	M8	–	–	–	–	19	–	29
140	M8	07/17/27/37/47	57	–	–	–	–	–
160	M8	07/17/27/37/47	57/67	27/37	–	19/37	37/47	30/37/47/29
160	M10	–	–	–	–	29/39	–	39/49
200	M10	37/47/57/67	57/67/77	47	–	29/47	57/67	39
200	M12	–	–	–	–	49	–	59
250	M12	57/67/77/87	67/77/87	57/67	–	57/67	77	–
300	M12	67/77/87	87/97	77	67/77	77	–	–
350	M16	77/87/97/107	97/107	87	87	87	87	–
400	M16	–	–	–	97	–	–	–
450	M16	97/107/127/137/ 147	107	97/107	107	97/107	97	–
550	M16	107/127/137/ 147/167	–	127	127	127	–	–
660	M20	147/167	–	157	157	157	–	–

4.3.5 Installation in damp locations or outdoors

NOTICE

Paint can block the breather valve and damage the sealing lips of the oil seals.

Damage to property.

- Thoroughly cover the breather valve and sealing lip of the oil seals with strips prior to painting/re-painting.
- Remove the adhesive strips after painting.

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Drives are supplied in corrosion-resistant designs with a suitable surface protection coating for use in damp areas or outdoors.

- Repair any damage to the paint work (e.g. on the breather valve or the lifting eyes).
- When motors are being mounted onto AMA.., AQA.. adapters and to AR.., AT.. start-up couplings and slip clutches, seal the flange areas with a suitable sealant (e.g. Loctite® 574).
- During outdoor setup, the drives must not be exposed to direct sunlight. Install appropriate protection devices, e.g. a cover or a canopy. The protection device must not cause heat build-up.
- The system operator must ensure that no foreign objects (e.g. falling objects or coverings) affect the operation of the gear unit.

4.3.6 Gear unit venting

NOTICE

Dirt and dust in the environment impair the function of the breather valve.

Potential damage to property.

- Check the breather valve function regularly and replace it if necessary.
- In the event of high dirt and dust load, use a breather filter instead of a breather valve.

Gear units with installed breather valve

Depending on gear unit size and mounting position, the gear units are delivered with the activated breather valve installed according to the mounting position. If the breather valve has not been activated yet, remove the transport protection as described in chapter "Activating the breather valve" (→ 🗎 40). This activates the breather valve.

Gear units with separately included breather valve

The following gear units are delivered with a screw plug on the provided breather hole:

- For gear units in the pivoted mounting position (stationary), see chapter "Gear units in pivoted mounting position (stationary)" (→ 🗎 147).
- For gear units in mounting position MX, see chapter "Mounting position MX" (→ 🗎 148).
- For gear units in the variable mounting position, see chapter "Variable mounting position" (→ 🗎 148).
- Gear head units vented on the input side.

Replace the screw plug with the provided breather valve before startup. The tightening torque can be found in chapter "Tightening torques for oil level plugs, oil drain plugs, screw plugs, breather valves and oil sight glasses" (→ 🗎 36).

Gear units that do not require venting

The following table lists gear units that do not require venting.

Gear unit	Mounting position
R..07	M1/M2/M3/M5/M6

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Gear unit	Mounting position
R..17/R..27/F..27	M1/M3/M5/M6
W..10/W..20/W..30	M1 to M6
W..37/W..47	M1/M2/M3/M5/M6
K..19/K..29	M1/M2/M3/M5/M6
W..19 to W..59	M1/M2/M3/M5/M6

Gear units that can be operated without venting after verification by SEW-EURODRIVE

Individual testing is required for certain gear units. Contact SEW-EURODRIVE in case of the following gear units:

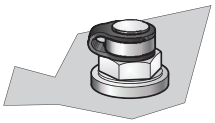
- Gear units in enclosed design
- Gear units in pivoted mounting position (dynamic), see chapter "Gear units in pivoted mounting position (dynamic)" (→ 🗎 147)

Gear units with gear unit venting on fixed piping

Gear units with gear unit venting on fixed piping (with expansion tank and ventilation filter) are delivered with a breather valve. Replace the breather valve with the supplied venting kit before starting up the gearmotor. Observe the installation notes provided with the respective venting system.

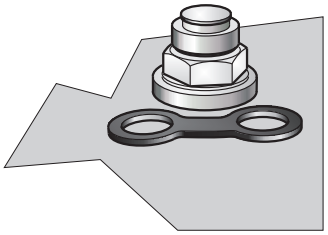
Activating the breather valve

1. Before startup, check whether the transport protection on the breather valve has been removed and the valve is therefore activated. The following figure shows a breather valve with transport protection:



2. Remove the transport protection.

⇨ The following figure shows an activated breather valve:



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4.3.7 Painting the gear unit

NOTICE

Paint can block the breather valve and damage the sealing lips of the oil seals.

Damage to property.

- Thoroughly cover the breather valve and sealing lip of the oil seals with strips prior to painting/re-painting.
- Remove the strips after painting.

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4.4 Gear unit with solid shaft

4.4.1 Assembling input and output elements

NOTICE

Damage to bearing, housing or shafts due to incorrect mounting.

Possible damage to property.

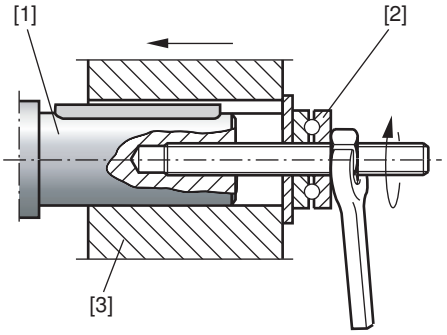
- Only use a mounting device for installing input and output elements (see chapter "Using the mounting device" (→ 🗎 42)). Use the threaded centering bore at the shaft end.
- Never force belt pulleys, couplings, pinions, etc. onto the shaft end by hitting them with a hammer.
- During the installation of belt pulleys, make sure the belt is tensioned correctly in accordance with the manufacturer's instructions.
- Make sure the transmission elements are balanced after fitting and do not give rise to any impermissible radial or axial forces. For the approved values, refer to the catalog "Gearmotors" or "Explosion-protected drives".

INFORMATION

Mounting is easier if you first apply lubricant to the output element or heat it up briefly to 80 °C – 100 °C.

Using a mounting device

The following figure shows a mounting device for installing couplings or hubs on gear unit or motor shaft ends. Should you be able to tighten the screw without any problems, you may not need the thrust bearing on the mounting device.



211368587

[1] Gear shaft end
[2] Thrust bearing
[3] Coupling hub

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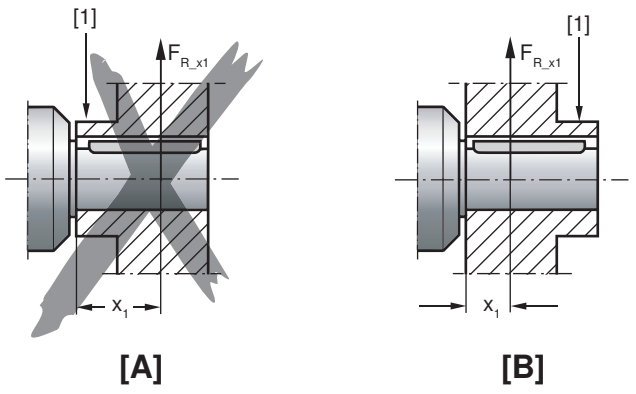
Avoiding high radial loads

To avoid high radial loads, mount gears and sprockets according to figure **B**.



9007199466105227

[1] Hub
[A] Incorrect assembly
F_{R_X1} Radial load at position x_1
[B] Correct assembly

4.4.2 Mounting of couplings

⚠ CAUTION

Risk of injury due to moving drive components and output elements, such as belt pulleys or couplings, during operation.

Risk of jamming and crushing.

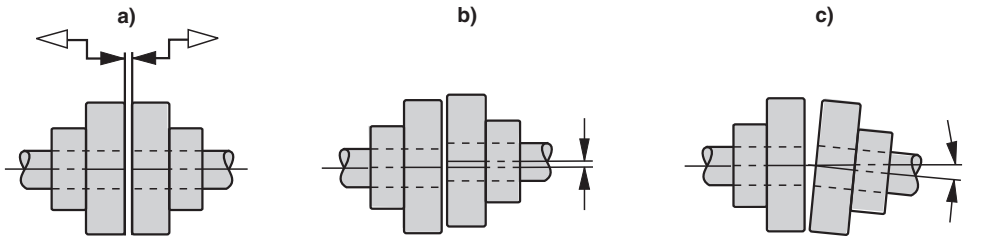
- Equip the input and output elements with a touch guard.

Adjust the following misalignments according to the coupling manufacturer's specifications when mounting couplings:

a) Maximum and minimum clearance

b) Axial misalignment

c) Angular offset



211395595

4.5 Torque arms for shaft-mounted gear units

4.5.1 Mounting the bushing

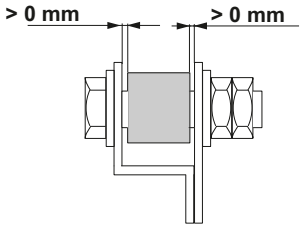
NOTICE

Damage to gear unit due to improper installation of the torque arm.

Damage to the gear unit.

- Do not deform the torque arm during installation.

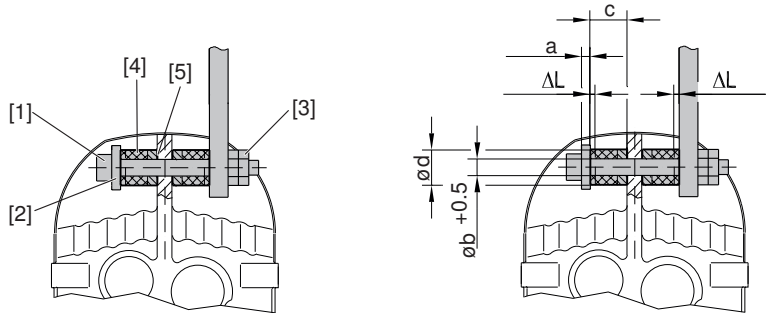
The following illustration shows a bushing attached at both sides without tightening:



15226229643

4.5.2 Mounting torque arms for parallel-shaft helical gear units

The following figure shows the torque support for parallel-shaft helical gear units in a loose condition.



36028797230330379

[1] Screw
[2] Washer
[3] Nuts
[4] Rubber buffer
[5] Metal side of the rubber buffer
a Washer width
b Rubber buffer inner diameter
c Rubber buffer length in loose state
d Rubber buffer diameter
ΔL Preload per rubber buffer in tightened state

Proceed as follows:

1. Make sure that the metal sides of the rubber buffers lay against the gear unit.
2. Use screws [1] and washers [2] according to the following table.
3. Secure the screw connection with a nut [3].
4. Tighten the screw [1] until the preload "Δ L" of the rubber buffers is reached in accordance with the following table:

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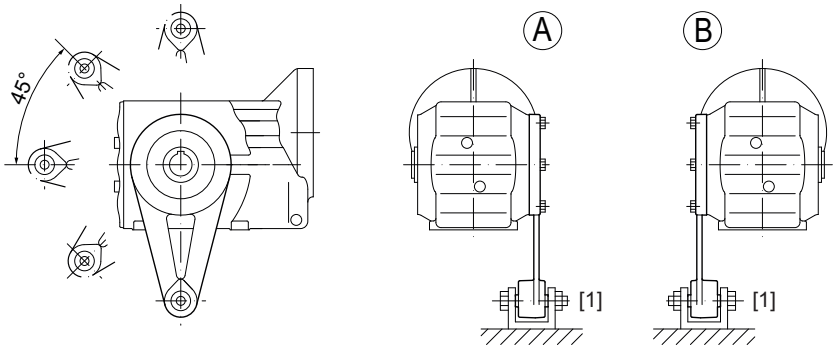
Gear unit	Washer	Rubber buffer			
	a	d	b	c	Δ L
	mm	mm	mm	mm	mm
F..27 /G	5	40	12.5	20	1
F..37 /G	5	40	12.5	20	1
F..47 /G	5	40	12.5	20	1.5
F..57 /G	5	40	12.5	20	1.5
F..67 /G	5	40	12.5	20	1.5
F..77 /G	10	60	21.0	30	1.5
F..87 /G	10	60	21.0	30	1.5
F..97 /G	12	80	25.0	40	2
F..107 /G	12	80	25.0	40	2
F..127 /G	15	100	32.0	60	3
F..157 /G	15	120	32.0	60	3

4.5.3 Mounting torque arms for helical-bevel gear units K..19 – K..49

The following figure shows the torque support for the helical-bevel gear units K..19 – K..49:



[1] Bushing
A Connection side
B Connection side

Observe the following points during assembly:

- Fasten the bushing [1] on both sides without mechanical stress, as described in chapter "Mounting the bushing" (→ 🗎 44).
- When tightening the screws, observe chapter "Notes concerning tightening torques" (→ 🗎 34).
- Refer to the following table for the screw sizes and tightening torques:

Gear unit	Screws	Tightening torque in Nm ±15%	
		Strength class	
		8.8	80
K..19 /T	4 × M8 × 20	28	28
K..29 /T	4 × M8 × 20	28	28

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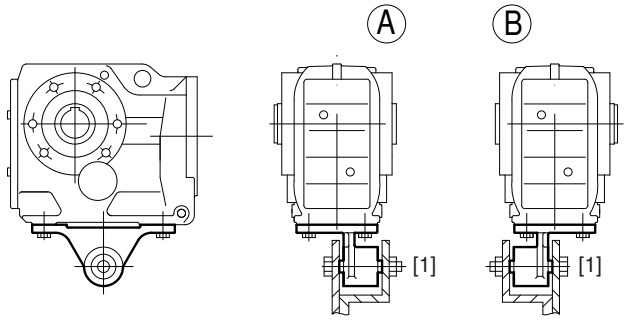
Gear unit	Screws	Tightening torque in Nm ±15% Strength class	
		8.8	80
K..39 /T	4 × M10 × 30	56	56
K..49 /T	4 × M12 × 35	96	96

4.5.4 Mounting torque arms for helical-bevel gear units K..37 – K..157

The following figure shows the torque support for the helical-bevel gear units K..37 – K..157.



36028797230326027

[1] Bushing
A Connection side
B Connection side

Observe the following points during assembly:

- Fasten the bushing [1] on both sides without mechanical stress, as described in chapter "Mounting the bushing" (→ 🗎 44).
- When tightening the screws, observe chapter "Notes concerning tightening torques" (→ 🗎 34).
- Refer to the following table for the screw sizes and tightening torques:

Gear unit	Screws	Tightening torque in Nm ±15% Strength class	
		8.8	80
K..37 /T	4 × M10 × 25	56	56
K..47 /T	4 × M10 × 30	56	56
K..57 /T	4 × M12 × 35	96	96
K..67 /T	4 × M12 × 35	96	96
K..77 /T	4 × M16 × 40	235	235
K..87 /T	4 × M16 × 40	235	235
K..97 /T	4 × M20 × 50	460	460
K..107 /T	4 × M24 × 60	795	795
K..127 /T	4 × M36 × 130	2760	2760
K..157 /T	4 × M36 × 130	2760	2760

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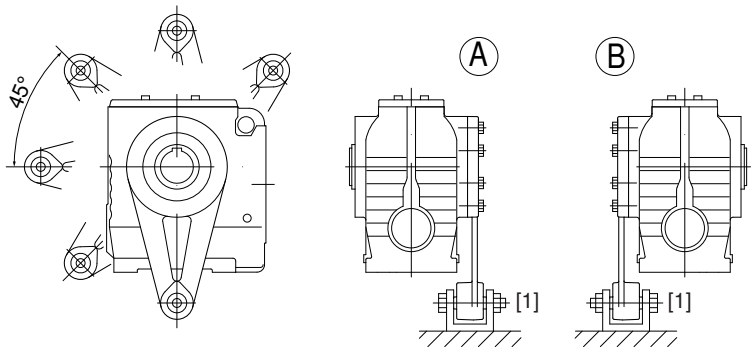
4.5.5 Mounting torque arms for helical-worm gear units

The following figure shows the torque support for helical-worm gear units.



36028797230455691

[1] Bushing
A Connection side
B Connection side

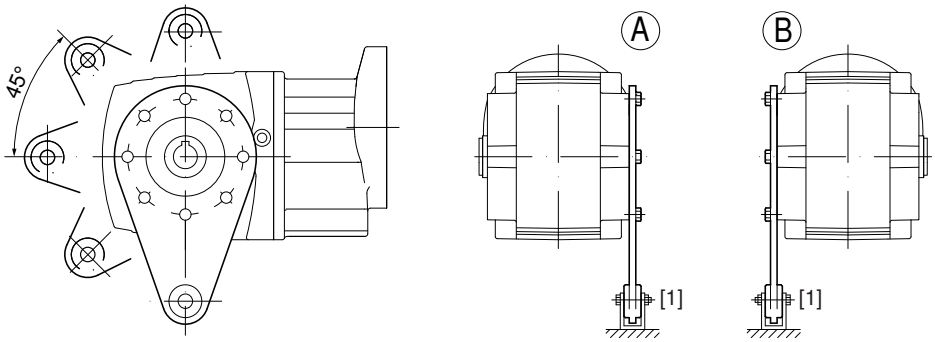
Observe the following points during assembly:

- Fasten the bushing [1] on both sides without mechanical stress, as described in chapter "Mounting the bushing" (→ 🗎 44).
- When tightening the screws, observe chapter "Notes concerning tightening torques" (→ 🗎 34).
- Refer to the following table for the screw sizes and tightening torques:

Gear unit	Screws	Tightening torque in Nm ±15% Strength class	
		8.8	80
S..37 /T	4 × M6 × 16	12	12
S..47 /T	4 × M8 × 25	28	28
S..57 /T	6 × M8 × 25	28	28
S..67 /T	4 × M12 × 35	96	96
S..77 /T	8 × M12 × 35	96	96
S..87 /T	8 × M16 × 45	235	235
S..97 /T	8 × M16 × 50	235	235

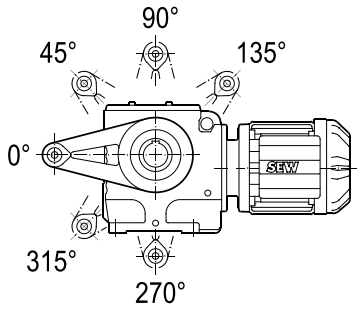
4.5.6 Mounting torque brackets for SPIROPLAN® W.. gear units

The following figure shows the torque support for SPIROPLAN® W.. gear units.



[1] Bushing
A Connection side
B Connection side

Exceptions: The 135° position is only possible for the SPIROPLAN® W..59 gear unit. For SPIROPLAN® W..29 and W..39 gear units, the 90° position is not possible.



- Fasten the bushing [1] on both sides without mechanical stress, as described in chapter "Mounting the bushing" (→ 🗎 44).
- When tightening the screws, observe chapter "Notes concerning tightening torques" (→ 🗎 34).
- Refer to the following table for the screw sizes and tightening torques:

Gear unit	Screws	Tightening torque in Nm ±15% Strength class	
		8.8	80
W..10 /T	4 × M6 × 16	12	12
W..19 /T	4 × M6 × 16	12	12
W..20 /T	4 × M6 × 16	12	12
W..29 /T	4 × M8 × 20	28	28
W..30 /T	4 × M6 × 16	12	12
W..37 /T	4 × M8 × 20	28	28
W..39 /T	4 × M8 × 20	28	28
W..47 /T	4 × M10 × 20	56	56
W..49 /T	4 × M10 × 30	56	56

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Gear unit	Screws	Tightening torque in Nm ±15% Strength class	
		8.8	80
W..59 /T	4 × M12 × 30	96	96

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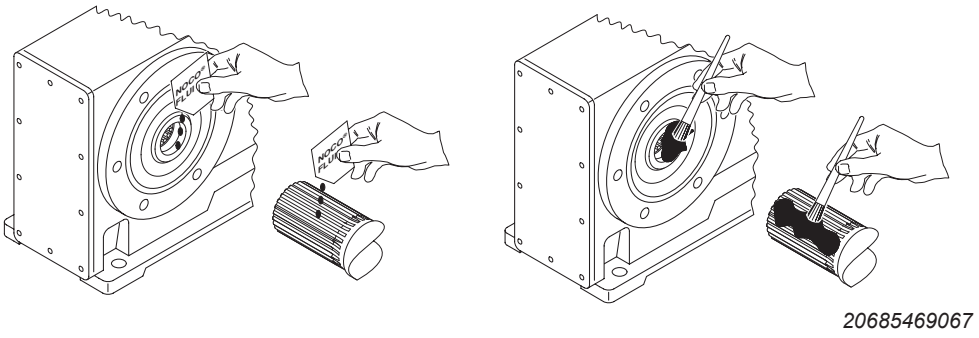
4.6 Mounting shaft-mounted gear units with splined hollow shaft

INFORMATION

Concerning the configuration of the customer shaft, also refer to the design notes in the "Gearmotors" catalog.

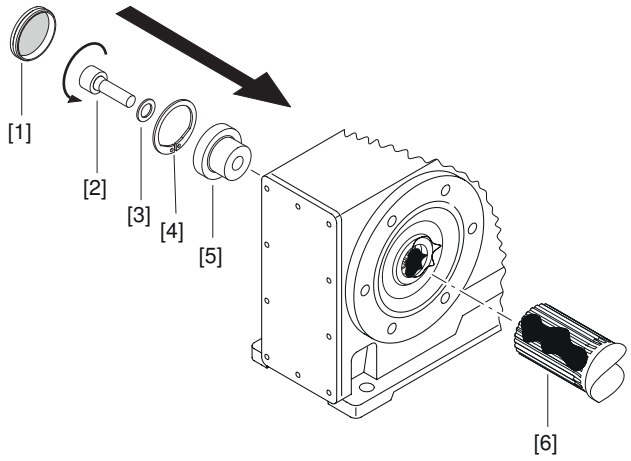
Proceed as follows:

1. Apply NOCO® fluid. Spread carefully.



20685469067

2. Install the shaft and secure it axially. For easier mounting, use a mounting device.



20685473931

[1] Closing plug
[2] Cap screw
[3] Supporting ring
[4] Retaining ring
[5] Washer

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4.7 Shaft-mounted gear units with keyway

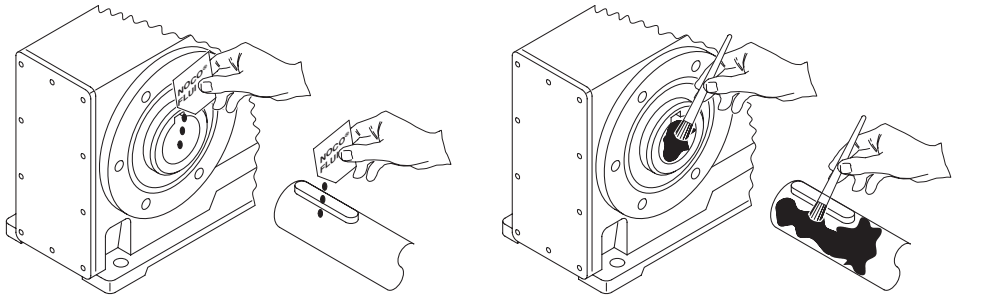
INFORMATION

Concerning the design of the customer shaft, also refer to the design notes in the "Gearmotors" catalog.

4.7.1 Mounting shaft-mounted gear units with keyway

Proceed as follows:

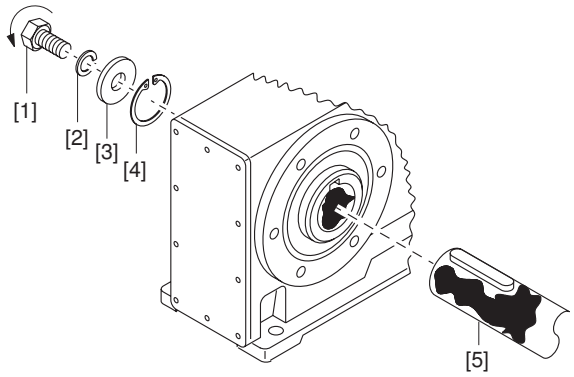
1. Apply NOCO® fluid. Spread carefully.



9007199466257163

2. Install the shaft and secure it axially. For easier installation, use a mounting device. Proceed according to one of the **3 mounting types**, depending on the scope of delivery.

A) Fit customer shaft (standard scope of delivery, except with shaft position AB):



18014398721000331

[1] Short retaining screw (standard scope of delivery)
[2] Lock washer
[3] Washer
[4] Retaining ring
[5] Customer shaft

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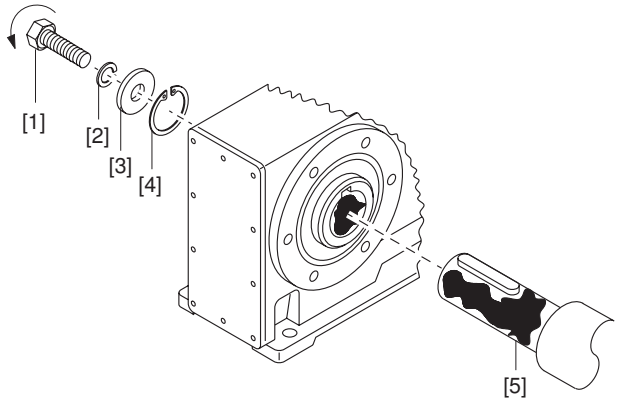
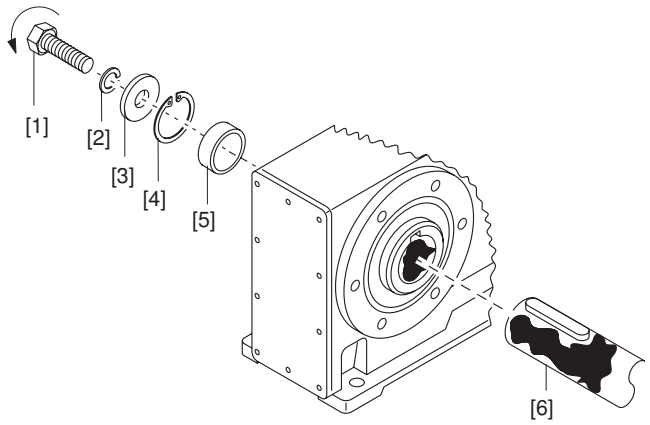
B) Mounting customer shaft with contact shoulder using the SEW-EURODRIVE assembly/disassembly kit:



18014398721002507

[1] Retaining screw
[2] Lock washer
[3] Washer
[4] Retaining ring
[5] Customer shaft with contact shoulder

C) Mounting customer shaft without contact shoulder using the SEW-EURODRIVE assembly/disassembly kit:



18014398721004683

[1] Retaining screw
[2] Lock washer
[3] Washer
[4] Retaining ring
[5] Spacer tube
[6] Customer shaft without contact shoulder

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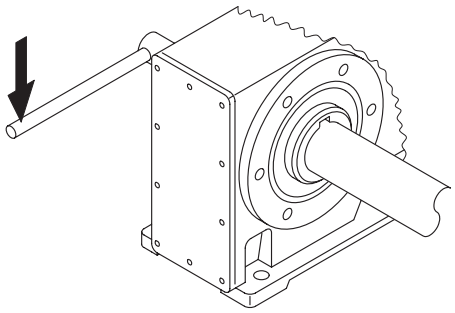
3. Tighten the retaining screw to the appropriate torque. Observe the tightening torques specified in the following table.

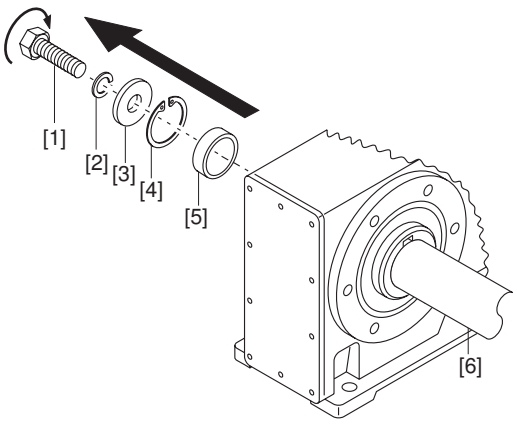


9007199466265867

Screw	Tightening torque Nm
M5	5
M6	8
M10/12	20
M16	40
M20	80
M24	200

4.7.2 Removing the shaft-mounted gear unit

This description is only applicable if the gear unit was assembled using the SEW-EURODRIVE assembly/disassembly kit (see step 2 of "Mounting the shaft-mounted gear unit").



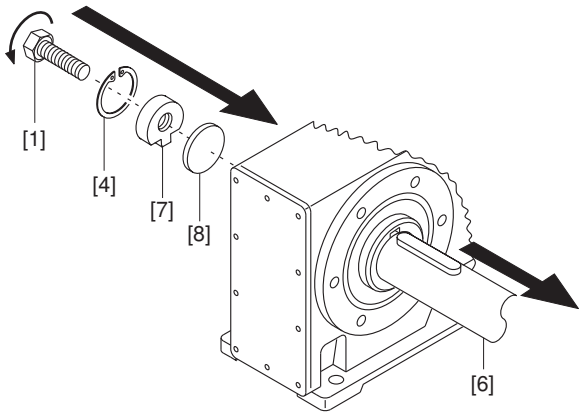
9007199466268043

[1] Retaining screw
[2] Lock washer
[3] Washer
[4] Retaining ring
[5] Spacer tube
[6] Customer shaft

Proceed as follows:

1. Loosen the retaining screw [1].
2. Remove parts [2] to [4] and, if applicable, the spacer tube [5].

3. Insert the forcing washer [8] and the fixed nut [7] from the SEW-EURODRIVE assembly/disassembly kit between the customer shaft [6] and the retaining ring [4] (see "SEW-EURODRIVE assembly/disassembly kit").
4. Re-install the retaining ring [4].
5. Re-install the retaining screw [1]. Press the gear unit off the shaft by tightening the screw.



9007199466270219

[1] Retaining screw
[4] Retaining ring
[6] Customer shaft
[7] Fixed nut
[8] Forcing washer

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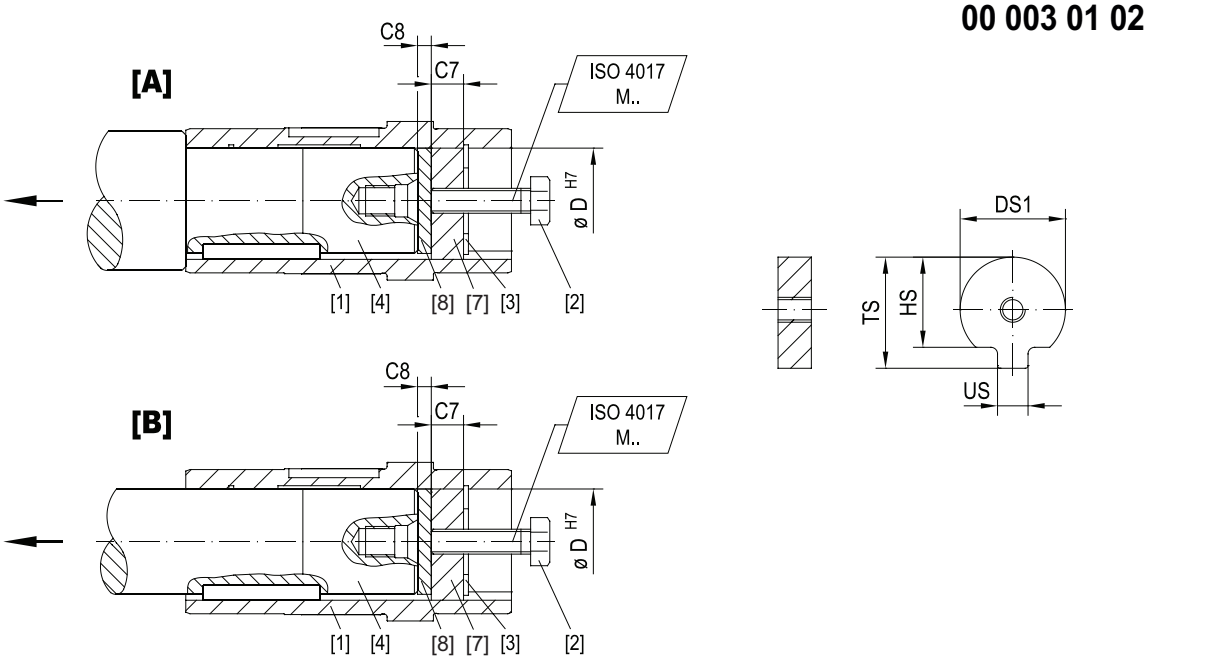
4.7.3 Assembly/disassembly kit from SEW-EURODRIVE

Applies only if the assembly/disassembly kit was previously used for installation.

1. Loosen the retaining screw [2].
2. Remove the retaining ring [3] and, if used, the spacer tube.
3. Insert the forcing washer [6] and the fixed nut [5] between the customer shaft [4] and retaining ring [3] as shown in the following figure.
4. Re-install the retaining ring [3].
5. Re-install the retaining screw [2]. Now you can force the gear unit off the shaft.

00 003 01 02



54043204711118091

C7 Width of fixed nut
C8 Width of forcing washer
D Hollow shaft diameter
DS1 Diameter of fixed nut
HS Height 1 fixed nut
TS Height 2 fixed nut
US Base width of fixed nut
[1] Hollow shaft
[2] Retaining screw
[3] Retaining ring
[4] Customer shaft
[7] Fixed nut for disassembly
[8] Forcing washer

Dimensions and part numbers of the assembly/disassembly kit:

Gear unit	D^{H7} mm	C8 mm	C7 mm	HS mm	US mm	TS mm	DS1 mm	ISO 4017 M..	Part number of the assembly/disassembly kit
WA..10	16	5	5	12	4.5	18	15.7	M5 × 50	06437125
WA..19, WA..20	18	5	6	13.5	5.5	20.5	17.7	M6 × 25	0643682X

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Gear unit	D^{H7} mm	C8 mm	C7 mm	HS mm	US mm	TS mm	DS1 mm	ISO 4017 M..	Part number of the assembly/disassembly kit
KA..19, SA..37, WA..19, WA..20, WA..29, WA..30	20	5	6	15.5	5.5	22.5	19.7	M6 × 25	06436838
FA..27, KA..29, SA..47,WA..29, WA..39	25	5	10	20	7.5	28	24.7	M10 × 35	06436846
FA..37, KA..29, KA..37, KA..39, SA..47, SA..57, WA..29, WA..39, WA..49	30	5	10	25	7.5	33	29.7	M10 × 35	06436854
FA..47, KA..39, KA..47, KA..49, SA..57, WA..49, WA..59	35	5	12	29	9.5	38	34.7	M12 × 45	06436862
FA..57, KA..57, FA..67, KA..49, KA..67, SA..67, WA..59	40	5	12	34	11.5	41.9	39.7	M16 × 50	06436870
SA..67	45	5	12	38.5	13.5	48.5	44.7	M16 × 50	06436889
FA..77, KA..77, SA..77	50	5	12	43.5	13.5	53.5	49.7	M16 × 50	06436897
FA..87, KA..87, SA..77, SA..87	60	5	16	56	17.5	64	59.7	M20 × 60	06436900
FA..97, KA..97, SA..87, SA..97	70	5	16	65.5	19.5	74.5	69.7	M20 × 60	06436919
FA..107, KA..107, SA..97	90	5	20	80	24.5	95	89.7	M24 × 70	06436927
FA..127, KA..127	100	5	20	89	27.5	106	99.7	M24 × 70	06436935
FA..157, KA..157	120	5	20	107	31	127	119.7	M24 × 70	06436943

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4.8 Shaft-mounted gear units with shrink disk

4.8.1 Mounting shaft mounted gear units with shrink disk

NOTICE

Deformation of the hollow shaft due to tightening the locking screws without first installing the shaft.

Gear unit damage.

- Never tighten the locking screws without the shaft installed.

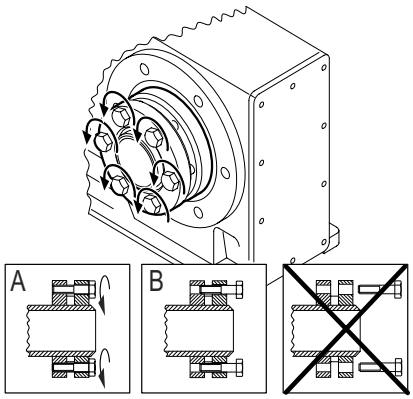
INFORMATION

The exact values for the tightening torques are shown on the shrink disk.

INFORMATION

Standard shrink disks and stainless steel shrink disks have the same tightening torques.

1. Slightly loosen the locking screws. Do not remove the locking screws completely.



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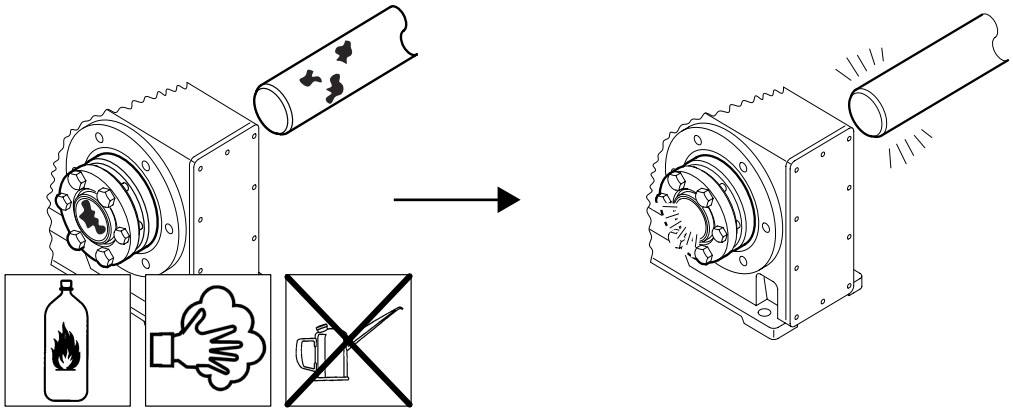
2. Carefully **degrease** the hollow shaft bore and the input shaft using a commercial solvent.



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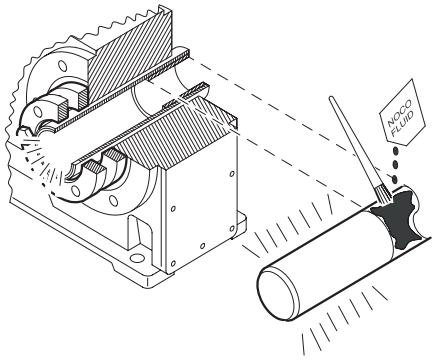
3. ⚠ **CAUTION!** Never apply NOCO® fluid directly onto the female contact, since the compound can get into the clamping area of the shrink disk when the machine shaft is fitted.
   Apply NOCO® fluid to the machine shaft in the vicinity of the female contact. It is essential to make sure that the clamping area of the shrink disk is free from grease.



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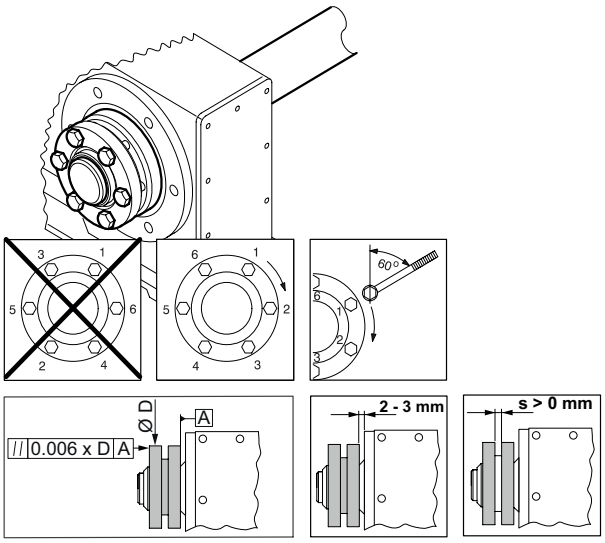
4. ⚠ **CAUTION!** Risk of injury due to falling shrink disk. Secure the shrink disk immediately after fitting the shaft.

5. Install the input shaft. Make sure that the outer rings of the shrink disk are plane-parallel.
6. For a gear unit with a shaft shoulder, fit the shrink disk to the shaft shoulder as far as it will go, whereby the minimum distance between the outer ring of the shrink disk facing the gear unit and the gear unit housing must be no less than 2 mm.
7. For a gear unit without shaft shoulder, mount the shrink disk at a distance of 2 to 3 mm from the gear unit housing.
8. Tighten the locking screws by working round several times from one screw to the next (not in diametrically opposite sequence). The tightening torques can be found in the following table.



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9. After installation, make sure the remaining gap "s" between the outer rings of the shrink disk is > 0 mm.

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10. To prevent corrosion, grease the outer surface of the hollow shaft around the shrink disk.
11. ⚠ **CAUTION!** Install the provided rotating safety cover or another, suitable protective cover at the shrink disk to prevent injuries. Never start up the drive if the protective covers are not installed.

Gear unit type				Locking screw ISO 4014/ISO 4017/ ISO 4762	Tightening torque ±4% Nm
KH..	FH..	SH..	WH..		
19/29	27	37	37/29/39	M5	5
37/39/47/49/57/67/77	37/47/57/67/77	47/57/67/77	47/49/59	M6	12
87/97	87/97	87/97	–	M8	30
107	107	–	–	M10	59
127/157	127/157	–	–	M12	100
167	–	–	–	M16	250
187	–	–	–	M20	470

4.8.2 Removing shaft-mounted gear units with shrink disk

INFORMATION

There is no need to dismantle clean, removed shrink disks before they are reinstalled.

1. ⚠ **CAUTION!** Risk of injury due to falling shrink disk. Secure the shrink disk before disassembly.
2. To prevent the outer rings from jamming, loosen the locking screws for a quarter turn, one after the other.
3. Steadily loosen the locking screws one after the other, but do not remove the locking screws completely.
4. If rust has formed on the shaft in front of the hub, remove the rust.
5. Remove the shaft or pull the hub off the shaft.
6. Remove the shrink disk from the hub.

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4.8.3 Cleaning and lubricating the shrink disk

If a removed shrink disk is clean, it does not have to be disassembled or re-greased before re-tightening.

The shrink disk only needs to be cleaned and greased if it is contaminated.

Use one of the following solid lubricants for the tapered surfaces:

Lubricant (Mo S_2)	Sold as
Molykote® 321 (lube coat)	Spray
Molykote® spray (powder spray)	Spray
Molykote® G Rapid	Spray or compound
Aemasol® MO 19P	Spray or compound
Aemasol® DIO setral 57 N (lube coat)	Spray

Grease the locking screws with a multipurpose grease such as Molykote® BR 2 or a similar grease.

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4.9 Shaft-mounted gear units with TorqLOC®

NOTICE

In the case of a fixed flange or foot mounting, stress can build up in the drive train because of the tolerance adjustment of the TorqLOC® shaft.

Damage to property.

- Only if it is ensured that no static overdetermination can occur may a flange or foot mounting be used for TorqLOC® installation. It must be possible to adjust the tolerance of the shaft.

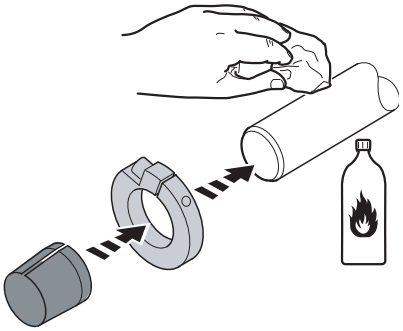
INFORMATION

In the case of flange mounting, it may no longer be possible to install the clamping ring depending on the size.

4.9.1 Mounting a customer shaft without contact shoulder

Proceed as follows:

1. Clean the customer shaft and the inside of the hollow shaft. Ensure that all traces of grease or oil are removed.
2. Install the stop ring and the bushing on the customer shaft.



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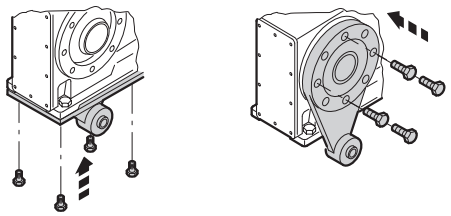
3. Fasten the torque arm to the drive unit. Observe the information in chapter "Torque arms for shaft-mounted gear units" (→ 🗎 44).



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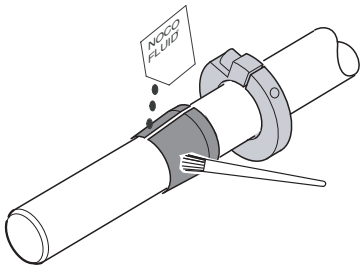
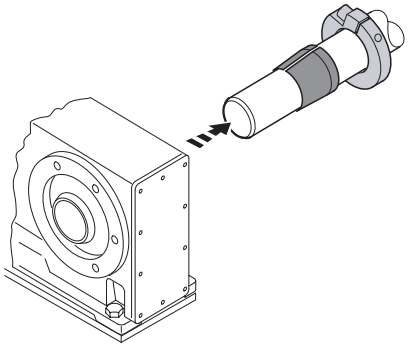
4. Apply NOCO® fluid to the bushing. Spread carefully.



211938827

5. Push the gear unit onto the customer shaft.



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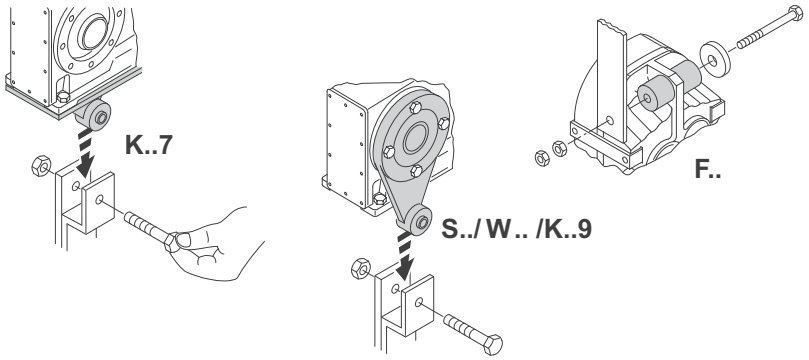
6. Preassemble the torque bracket. Do not firmly tighten the screws.



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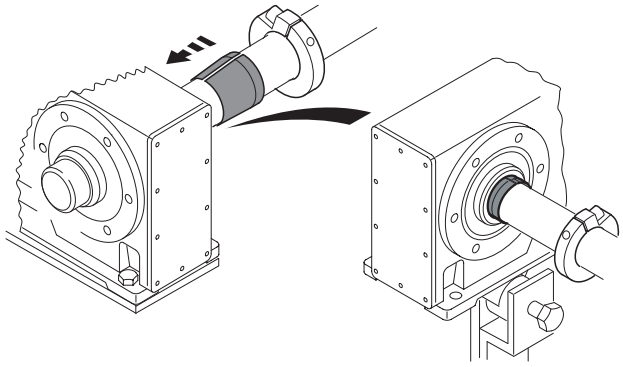
7. Push the bushing into the gear unit up to the stop.



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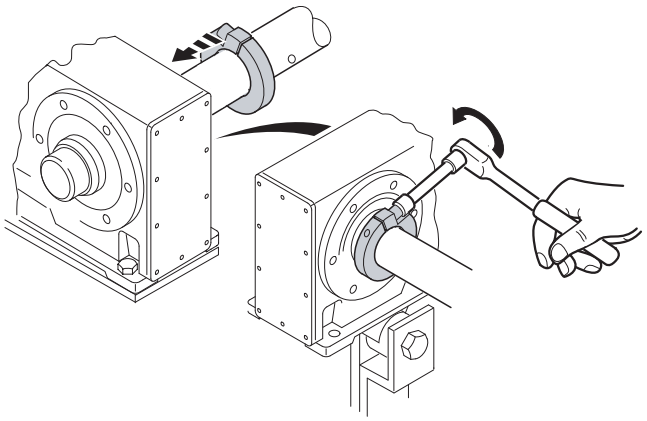
8. Secure the bushing with the stop ring. Attach the stop ring to the bushing with the respective tightening torque. Refer to the following table for the suitable tightening torque.



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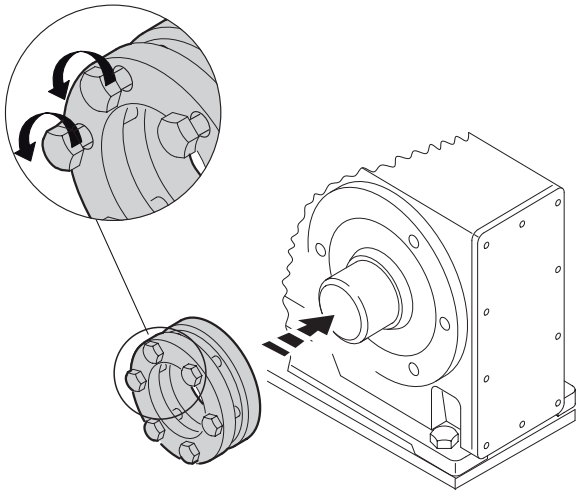
Gear unit type				Tightening torque Nm	
FT..	KT..	ST..	WT..	Default	Stainless steel
–	19	37	37/29	10	10
37	29/37	47	47/39	10	10
47	39/47	57	49	10	10
57/67	49/57/67	67	59	25	25
77	77	77	–	25	25
87	87	87	–	25	25
97	97	97	–	25	25
107	107	–	–	38	38
127	127	–	–	65	65
157	157	–	–	150	150

9. Make sure that all screws are loosened and slide the shrink disk onto the hollow shaft.



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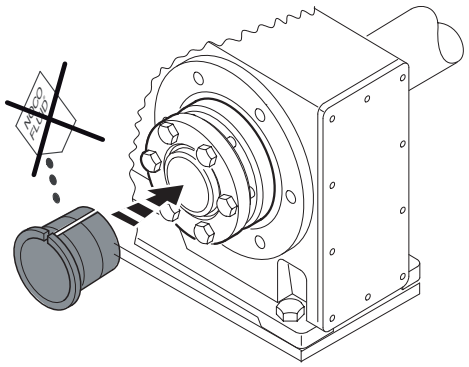
10. Slide the counter bushing onto the customer shaft and into the hollow shaft. Make sure that the gear unit is mounted flush with the customer shaft.



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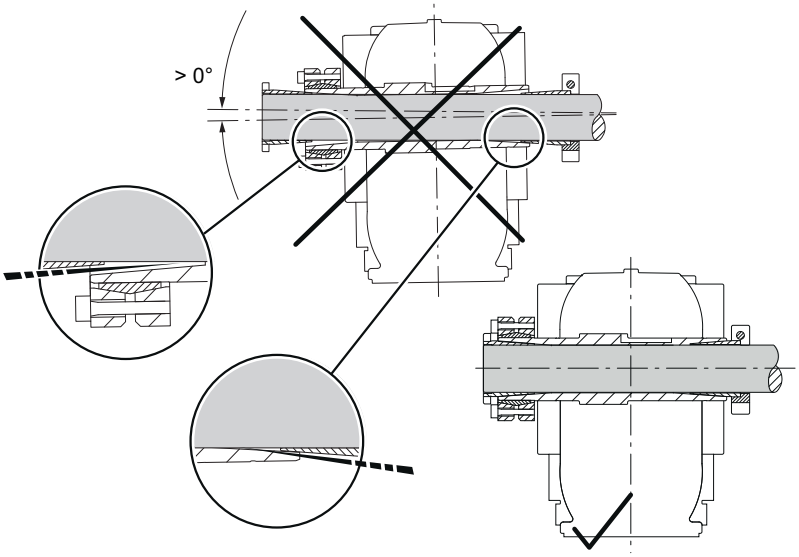

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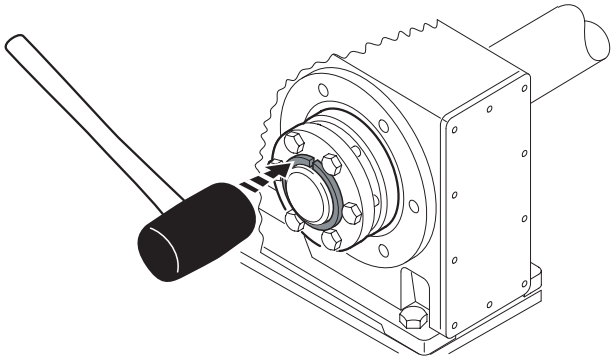
11. If you have a gear unit **with a shaft shoulder**, then fit the shrink disk to the shaft shoulder as far as it will go, whereby the minimum distance between the outer ring of the shrink disk facing the gear unit and the gear unit housing must be no less than 2 mm. In the case of a gear unit **without a shaft shoulder**, mount the shrink disk at a distance of 2 – 3 mm from the gear unit housing.
12. Tap lightly on the flange of the counter bushing to ensure that the bushing is fitted securely in the hollow shaft.



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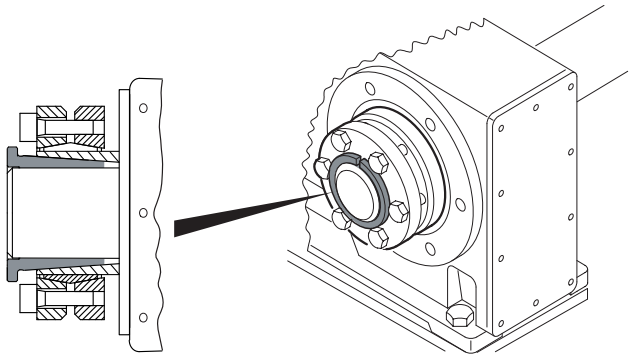
13. Make sure that the customer shaft is seated in the counter bushing.



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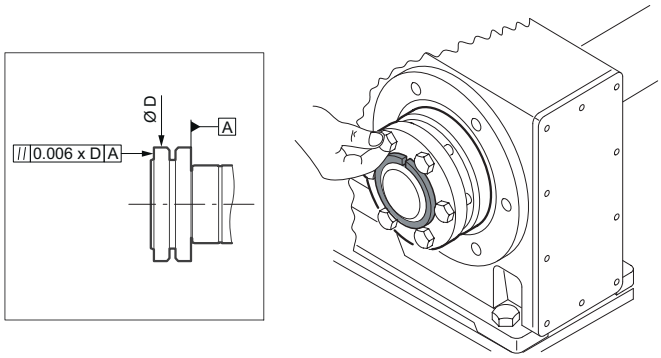
14. Manually tighten the screws of the shrink disk. Make sure that the outer rings of the shrink disk are plane-parallel.



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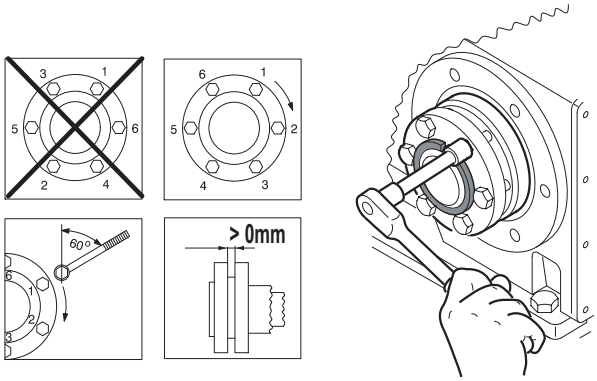
15. Tighten the locking screws with the specified tightening torque in accordance with the following table. Tighten the screws by working round several times from one bolt to the next (not in diametrically opposite sequence).



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INFORMATION

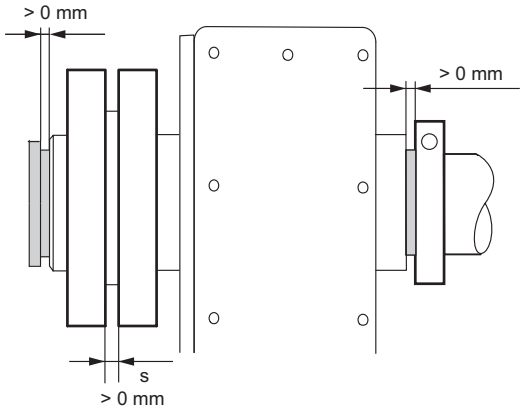
The exact values for the tightening torques are shown on the shrink disk.

INFORMATION

Standard shrink disks and stainless steel shrink disks have the same tightening torques.

Gear unit type				Locking screw	Tightening torque ±4%
FT..	KT..	ST..	WT..	ISO 4762	Nm
–	19	37	37/29	M5	4
–	29		39	M5	5
37	37	47	47	M6	12
47/57/67	39/47/49/57/67	57/67	49/59	M6	12
77/87/97	77/87/97	77/87/97	–	M8	30
107	107	–	–	M10	59
127/157	127/157	–	–	M12	100

16. After installation, make sure the remaining gap "s" between the outer rings of the shrink disk is > 0 mm.
17. Make sure that the remaining gap between counter bushing and hollow shaft end, as well as between hollow shaft end and the stop ring is > 0 mm.



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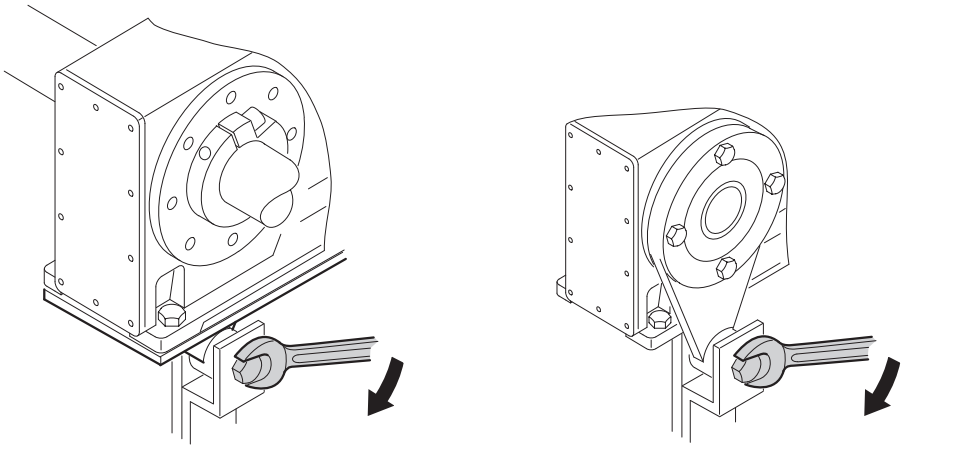
18. Tighten the torque bracket. Observe the information in chapter "Torque arms for shaft-mounted gear units" (→ 🗎 44).



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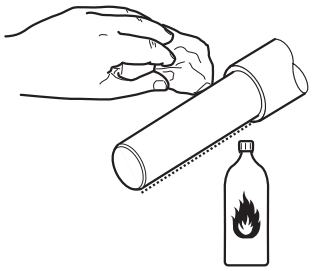
4.9.2 Mounting a customer shaft with contact shoulder

1. Clean the customer shaft and the inside of the hollow shaft. Ensure that all traces of grease or oil are removed.



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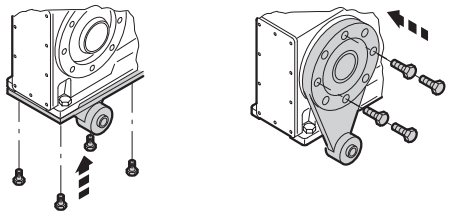
2. Attach the torque bracket to the drive unit. Observe the information in chapter "Torque arms for shaft-mounted gear units" (→ 🗎 44).



K..7 **S../W../K..9**

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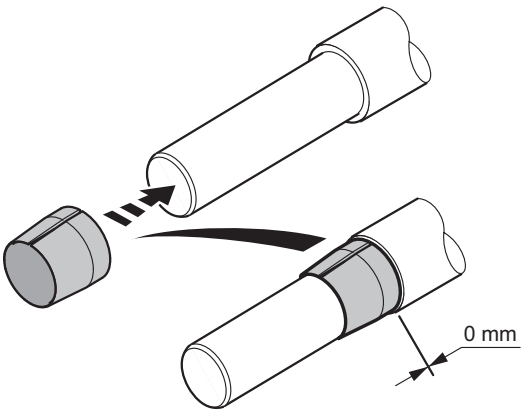
3. Slide the bushing onto the customer shaft.



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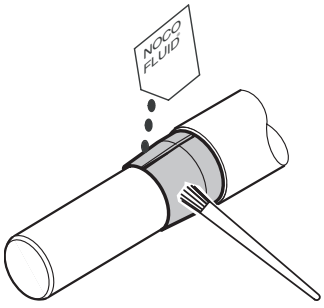
4. Apply NOCO® fluid to the bushing. Spread carefully.



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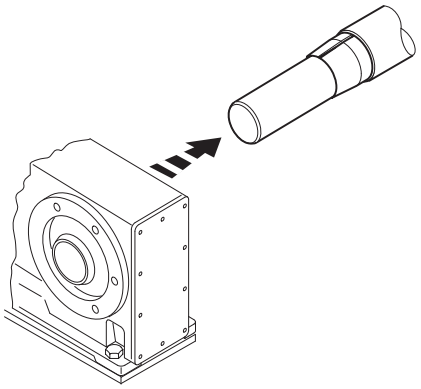
5. Push the gear unit onto the customer shaft.



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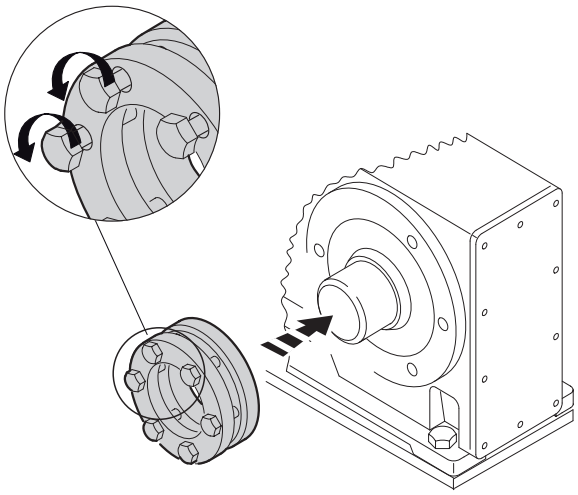
6. Ensure that all screws are loosened. Slide the shrink disk onto the hollow shaft.



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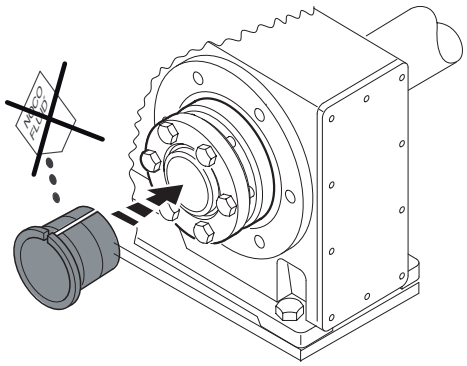
7. Slide the counter bushing onto the customer shaft and into the hollow shaft. Make sure that the gear unit is mounted flush with the customer shaft.



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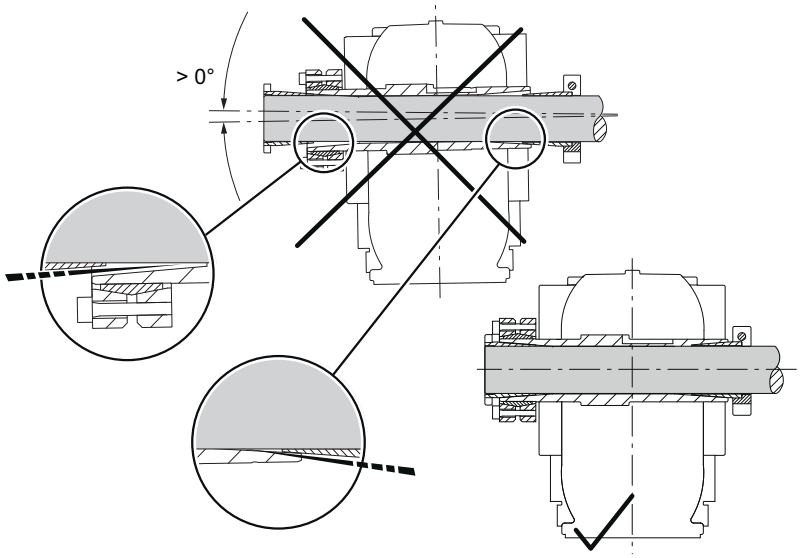

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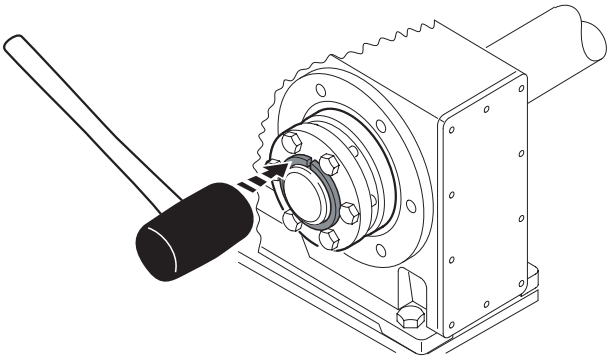
8. In the case of a gear unit **with a shaft shoulder**, fit the shrink disk to the shaft shoulder as far as it will go. If the case of a gear unit **without a shaft shoulder**, then fit the shrink disk at a distance of 2 – 3 mm from the gear unit housing, whereby the minimum distance between the outer ring of the shrink disk facing the gear unit and the gear unit housing must be no less than 2 mm.
9. Tap lightly on the flange of the counter bushing to ensure that the bushing is fitted securely in the hollow shaft.



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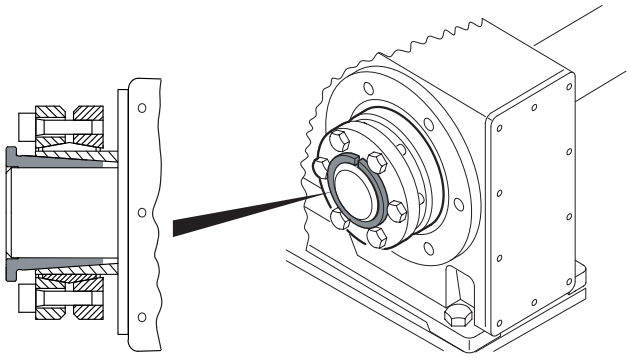
10. Make sure that the customer shaft is seated in the counter bushing.



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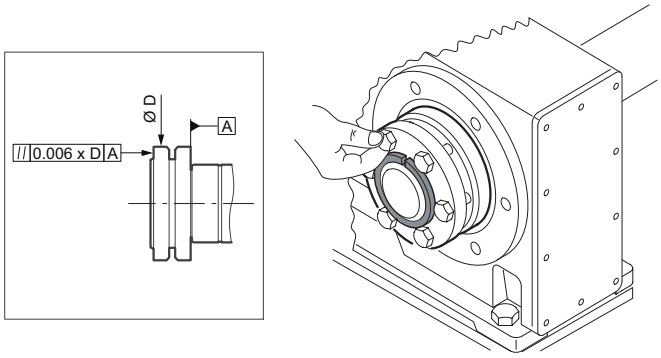
11. Manually tighten the screws of the shrink disk. Make sure that the outer rings of the shrink disk are plane-parallel.



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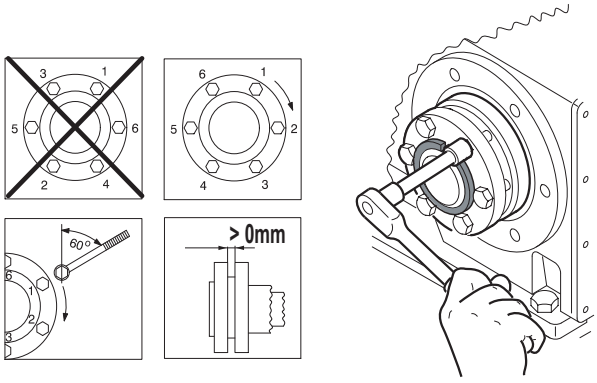
12. Tighten the locking screws with the specified tightening torque in accordance with the following table. Tighten the screws by working round several times from one bolt to the next (not in diametrically opposite sequence).



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INFORMATION

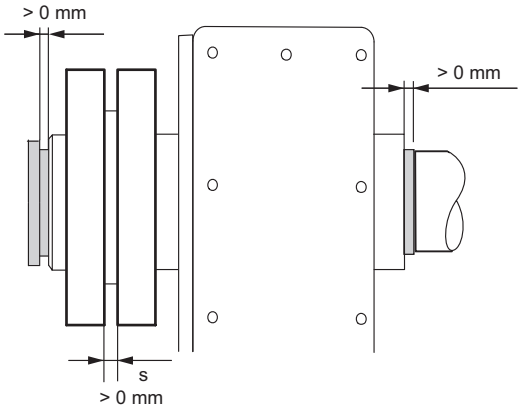
The exact values for the tightening torques are shown on the shrink disk.

INFORMATION

Standard shrink disks and stainless steel shrink disks have the same tightening torques.

Gear unit type				Locking screw	Tightening torque ±4%
FT..	KT..	ST..	WT..	ISO 4762	Nm
–	19	37	37/29	M5	4
–	29		39	M5	5
37	37	47	47	M6	12
47/57/67	39/47/49/57/67	57/67	49/59	M6	12
77/87/97	77/87/97	77/87/97	–	M8	30
107	107	–	–	M10	59
127/157	127/157	–	–	M12	100

13. After installation, make sure the remaining gap "s" between the outer rings of the shrink disk is > 0 mm.
14. Make sure that the remaining gap between counter bushing and hollow shaft end, as well as between the hollow shaft end and customer shaft shoulder is > 0 mm.



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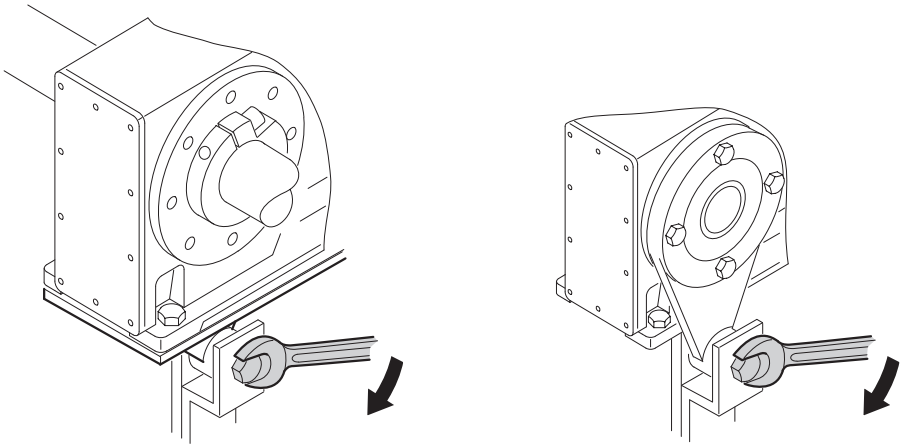
15. Mount the torque bracket and firmly tighten it. Observe the information in chapter "Torque arms for shaft-mounted gear units" (→ 🗎 44).



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4.9.3 Removing the shaft-mounted gear unit

⚠ CAUTION

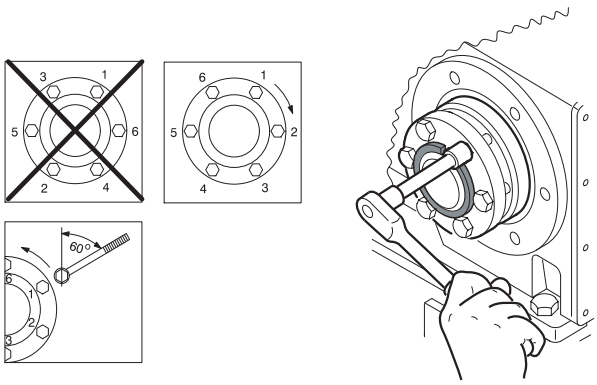
Risk of burns caused by hot surfaces.

Severe injuries.

- Let the units cool down before working on them.

Proceed as follows:

1. To prevent the outer rings from jamming, loosen the locking screws by a quarter revolution, one after the other.



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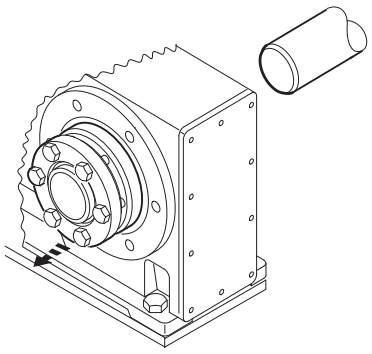
2. Unscrew the locking screws evenly one after the other. Do not remove the locking screws completely.
3. Dismantle the conical steel bushing. If required, use the outer rings as pullers. Proceed as follows:

- Remove all the locking screws.
- Screw the respective number of screws in the tapped holes of the shrink disk.
- Support the inner ring against the gear unit housing.
- Pull off the conical steel bushing by tightening the screws.

4. Remove the gear unit from the shaft.



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5. Remove the shrink disk from the hub.

INFORMATION

There is no need to dismantle removed shrink disks before they are reinstalled.

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4.9.4 Cleaning and lubricating shaft-mounted gear units

Proceed as follows:

1. If the shrink disk is dirty, clean and lubricate the shrink disk.
2. Lubricate the tapered surfaces. Use one of the following solid lubricants:

Lubricant (Mo S2)	Sold as
Molykote® 321 (lube coat)	Spray
Molykote® spray (powder spray)	Spray
Molykote® G Rapid	Spray or compound
Aemasol® MO 19P	Spray or compound
Aemasol DIO-setral 57 N (lube coat)	Spray

3. Grease the locking screws with a multipurpose grease such as Molykote BR 2.

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4.10 Mounting the cover

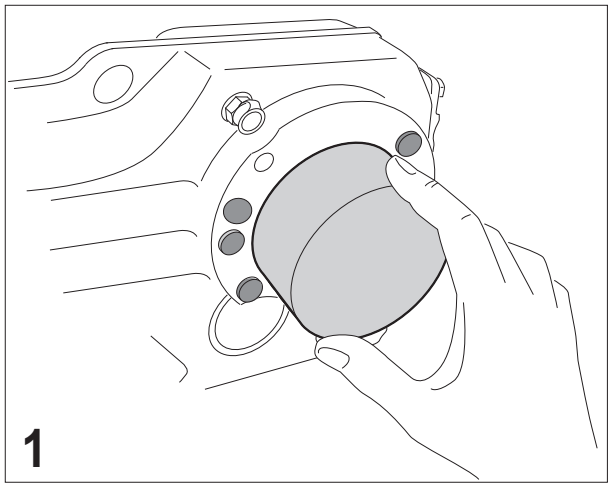
⚠ CAUTION

Injury due to assembly work during operation.

Risk of injury

- Before you begin working on the unit, disconnect the motor from the power supply. Safeguard the drive against unintentional restart.

4.10.1 Installing the rotating safety cover



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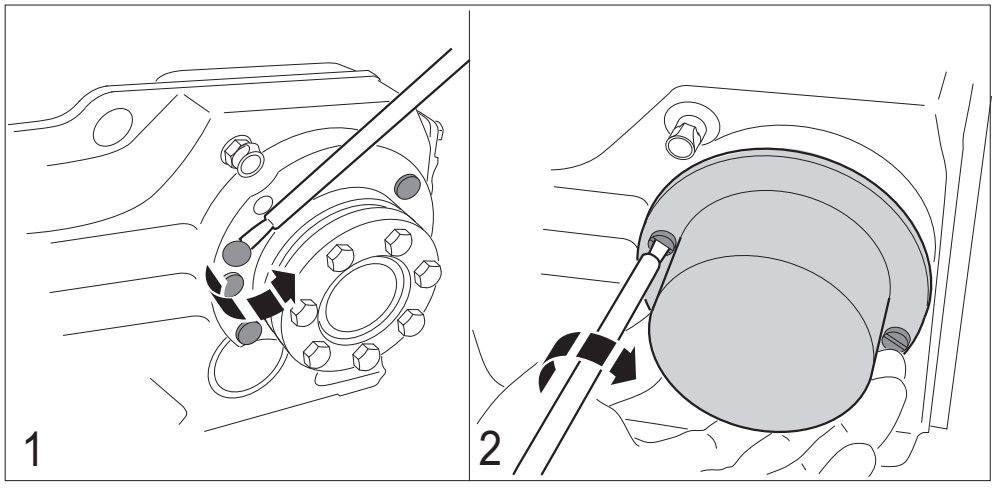
1. Slide the rotating safety cover onto the shrink disk until it snaps in.

4.10.2 Mounting the fixed cover

Proceed as follows:

1. Remove the plastic plug on the gear unit housing (see figure 1).



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2. Use the delivered screws to mount the cover to the gear unit housing (see figure 2).

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4.10.3 Operation without cover

In certain application cases, e.g. with a through-shaft, a cover cannot be installed. The cover is not necessary if the system or unit manufacturer provides corresponding components to guarantee for compliance with the required degree of protection. If this results in additional maintenance, the manufacturer has to describe this in the operating instructions for the system or component.

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4.11 AMS.. adapter

4.11.1 Figure and note concerning the installation of the AMS.. adapter

NOTICE

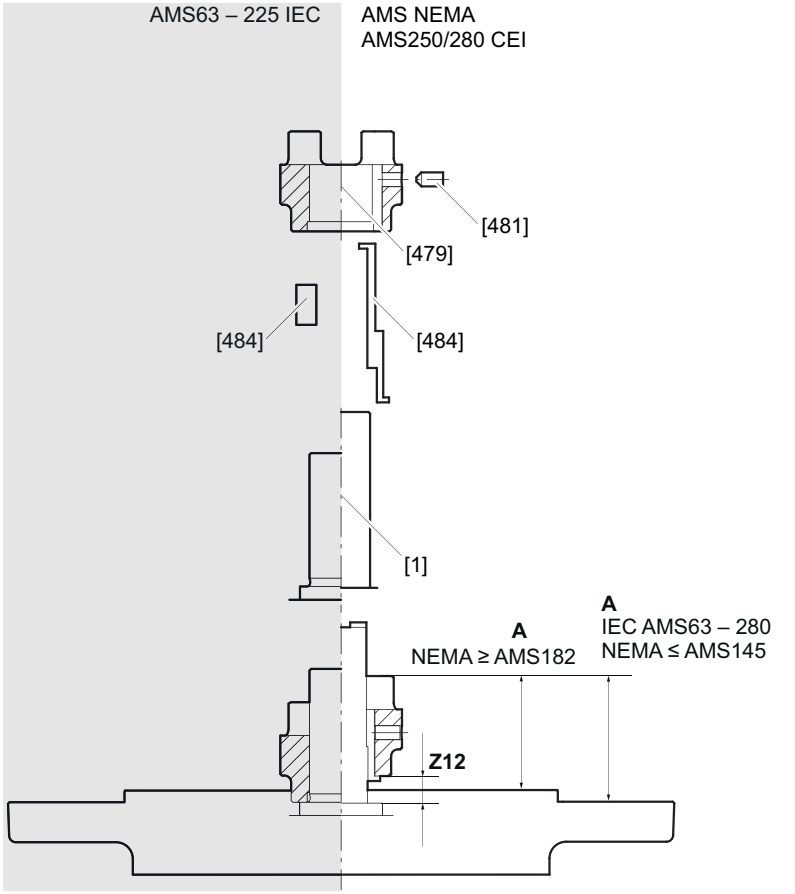
Damage to the adapter due to the ingress of moisture or dirt (e.g. dust) when a motor/drive is attached to the adapter.

Damage to the adapter.

- Seal the adapter with an anaerobic fluid seal.
- When the motor/drive to be attached has openings or bores that provide access to the inside of the adapter, seal these against dust or liquid.

INFORMATION

To avoid contact corrosion, SEW-EURODRIVE recommends applying NOCO® fluid to the motor shaft before mounting the coupling half.



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[1] Motor shaft
[479] Coupling half
[481] Set screw
[484] Key
A Distance A
Z12 Distance between shaft shoulder and coupling

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4.11.2 Fitting the motor to IEC adapters AMS63 – 225

1. Clean the motor shaft [1] and the flange surfaces of the motor and the adapter.
2. Remove the key from the motor shaft. Replace this key with the supplied key [484]. **Notice!** The key must not protrude beyond the base of the coupling claw in the installed condition.
3. Heat the coupling half [479] to approx. 80 °C to 100 °C. Slide the coupling half onto the shoulder of the motor shaft as far as it will go.
4. Check the position of the coupling half. The values for distance "A" are listed in the following table.
5. Secure the key and the coupling half to the motor shaft using the set screw [481]. Refer to the following table for the required tightening torque "T_A".
6. Seal the contact surfaces between the adapter and motor using a suitable sealing compound.
7. Fit the motor to the adapter in such a way that the coupling claws of the adapter shaft engage in the plastic coupling ring. Adhere to the tightening torques specified in chapter "Tightening torques for motor to adapter" (→ 🗎 85).

IEC adapter AM63 to 225: Distance A and tightening torque T_A

	63/71	80	90	100/112	132	160/180	200	225
A /mm	27.3	30	39	48.5	56.5	80.5	78	93
T_A /Nm	1.5	2	2	4.8	10	17	17	17
Thread	M4	M5	M5	M6	M8	M10	M10	M10

4.11.3 Fitting the motor to IEC adapter AMS250/280 and NEMA adapter AMS56 – 365 with the provided key

1. Clean the motor shaft [1] and the flange surfaces of the motor and the adapter.
2. Remove the key from the motor shaft. Replace this key with the provided key [484]. The position of the key is dependent upon the adapter: **AMS250-280**: The key must lie against the shoulder of the motor shaft. **NEMA**: The shoulder of the key must lie against the front of the motor shaft.
3. Heat the coupling half [479] to approx. 80 °C – 100 °C and slide the coupling half onto the motor shaft. Slide the coupling half onto the shoulder of the key as far as it will go.
4. Check the position of the coupling half. The values for distance "A" are listed in the following table.
5. Secure the key and the coupling half to the motor shaft using the set screw [481]. Refer to the following table for the required tightening torque "T_A".
6. Seal the contact surfaces between the adapter and motor using a suitable sealing compound.
7. Fit the motor to the adapter in such a way that the coupling claws of the adapter shaft engage in the plastic coupling ring. Adhere to the tightening torques specified in chapter "Tightening torques for motor to adapter" (→ 🗎 85).

IEC adapter AMS250/280: Distance A and tightening torque T_A

	250/280
A /mm	139

	250/280
T_A /Nm	17
Thread	M10

NEMA adapter AMS56 – 365: Distance A and tightening torque T_A

	56	143/145	182/184	213/215	254/256 284/286	324/326 364/365
A /mm	37.7	46.3	54.2	61.2	81.6	90.4
T_A /Nm	2	2	4.8	10	17	17
Thread	M5	M5	M6	M8	M10	M10

4.11.4 Fitting the motor to IEC adapters AMS250/280 and NEMA adapters AMS56 – 365 with standard key

1. Clean the motor shaft [1] and the flange surfaces of the motor and the adapter.
2. Remove the key from the motor shaft. Replace this with a standard key. The required standard key size can be found in the following table. **Notice!** The key must not protrude beyond the base of the coupling claw in the installed condition.
3. Heat the coupling half [479] to approx. 80 °C – 100 °C and slide the coupling half onto the motor shaft. Slide the coupling half onto the motor shaft up to distance Z12. The values for distance "Z12" are listed in the following table.
4. Check the position of the coupling half. The values for distance "A" are listed in the table in chapter "Fitting the motor to IEC adapter AMS250/280 and NEMA adapter AMS56 – 365 with the provided key" (→ 🗎 77).
5. Secure the key and the coupling half to the motor shaft using the set screw [481]. The required tightening torque "T_A" can be found in the table in chapter "Fitting the motor to IEC adapter AMS250/280 and NEMA adapter AMS56 – 365 with the provided key" (→ 🗎 77).
6. Seal the contact surfaces between the adapter and motor using a suitable sealing compound.
7. Fit the motor to the adapter in such a way that the coupling claws of the adapter shaft engage in the plastic coupling ring. Adhere to the tightening torques specified in chapter "Tightening torques for motor to adapter" (→ 🗎 85).

Adapter	Z12 mm	Standard key[1)] inch	Standard key[2)] mm
AMS56	3.1	B3/16 × 3/16 × 7/16	–
AMS143/145	10.6	B3/16 × 3/16 × 9/16	–
AMS182/184	9	B1/4 × 1/4 × 1/2	–
AMS213/215	11.3	B5/16 × 5/16 × 13/16	–
AMS254/256	7.4	B3/8 × 3/8 × 1 1/4	–
AMS284/286	13.8	B1/2 × 1/2 × 1 1/4	–
AMS324/326	18.7	B1/2 × 1/2 × 1 1/2	–
AMS364/365	19	B5/8 × 5/8 × 1 1/4	–
AMS250	19	–	B18 × 11 × 70

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Adapter	Z12 mm	Standard key[1] inch	Standard key[2] mm
AMS280	19	–	B20 × 12 × 70

1) The key size relates to material type 1045 or type 1018 in accordance with ASTM A 29/A29M.
2) The key size relates to material C45+C in accordance with DIN EN 10277-2.

4.11.5 Permitted loads

NOTICE

The gear unit can become overloaded due to excessive weight or the excessive power rating of an attached motor.

Gear unit damage.

- Note that the load data specified in the following table is not to be exceeded.
- Ensure that the permitted power rating (torque and speed) on the adapter is adhered to according to the nameplate.

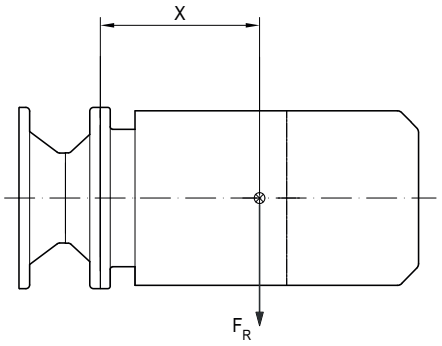
NOTICE

Danger due to static overdetermination if motors are additionally attached via a foot plate.

Damage to property.

- A motor attached at the foot relieves the interface at the adapter; however, make sure that the installed foot-mounted motor is attached to the customer's construction in a stress-free manner.

The following figure shows the load caused by the motor mass:



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⊗ Motor's center of gravity
x Distance from adapter flange to motor's center of gravity
F_R Overhung load

Permitted loads for gear unit type series R.., F..[2], K.., S.., and W..9:

IEC adapter	x[1]	Gear unit input end flange diameter	Default	/DH option	/RS option
	mm	mm	F_R[1] in N	F_R[1] in N	F_R[1] in N
AMS63/71 [2]	77	105	260	220	–
		≥ 120	530	455	–
AMS80 [2]	113	105	300	265	–
		120	420	370	350
		≥ 160	1000	880	820
AMS90 [2]	113	120	420	375	350
		≥ 160	1000	895	840
AMS100/112 [2]	144	≥ 160	2000	1685	1685
AMS132 [2]	186	160	1600	1375	1370
		≥ 200	4700	4060	4055
AMS160/180	251	≥ 250	4600	4200	4600
AMS200/225	297	≥ 300	5600	5600	5600
AMS250/280	390	≥ 450	11 200	11 200	11 200

NEMA adapter	x[1]	Gear unit input end flange diameter	Default	/DH option	/RS option
	mm	mm	F_R[1] in N	F_R[1] in N	F_R[1] in N
AMS56	77	105	215	185	–
		≥ 120	445	385	–
AMS143/145	113	120	410	370	345
		≥ 160	965	865	820
AMS182/184	144	≥ 160	1960	1660	1660
AMS213/215	186	160	1585	1360	1360
AMS213/215		≥ 200	4640	4010	4010
AMS254 to 286	251	≥ 250	4525	4135	4525
AMS324 to 365	297	≥ 300	5600	5600	5600

[1] Maximum load values for connection screws of strength class 8.8. If the center of gravity distance x increases, the maximum permitted weight F_R of the attached motor must be reduced linearly. If the center of gravity distance x decreases, the maximum permitted weight F_R must not be increased.

[2] An extended adapter is used for certain adapter combinations with parallel-shaft helical gear units (see following table) to avoid collisions with the safety cover. This changes the maximum permitted weight to F_R.

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Deviating permitted loads for certain adapter combinations with parallel-shaft helical gear units

IEC adapter	x[1]	Gear unit size	Gear unit safety cover		Default
	mm		High fixed plastic safety cover	Fixed tin sheet metal safety cover (standard for TorqLOC® and ATEX)	F_R[1] in N
AMS71	77	F..37	X	X	455
AMS80	113	F..37, F..47	X	X	370
		F..57	X	X	880
AMS90	113	F..37, F..47	X	X	375
		F..57	X	X	895
AMS100/112	144	F..57		X	1685
AMS132	186	F..77		X	4060

[1] Maximum load values for connection screws of strength class 8.8. If the center of gravity distance x increases, the maximum permitted weight F_R of the attached motor must be reduced linearly. If the center of gravity distance x decreases, the maximum permitted weight F_R must not be increased.

Permitted loads for gear unit type series SPIROPLAN® W..37/W..47

IEC adapter	x[1]	Default	/DH option	/RS option
	mm	F_R[1] in N	F_R[1] in N	F_R[1] in N
AMS63/71	115	140	125	–
AMS80/90	151	270	245	230

NEMA adapter	x[1]	Default	/DH option	/RS option
	mm	F_R[1] in N	F_R[1] in N	F_R[1] in N
AMS56	115	120	105	–
AMS143/145	151	265	240	230

[1] Maximum load values for connection screws of strength class 8.8. If the center of gravity distance x increases, the maximum permitted weight F_R of the attached motor must be reduced linearly. If the center of gravity distance x decreases, the maximum permitted weight F_R must not be increased.

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Permissible power ratings and mass moments of inertia

The following table shows the permitted power ratings and mass moments of inertia:

Adapter		P_m [1]	$J_{Adapter}$
IEC	NEMA	kW	kg × m²
AMS63	–	0.25	0.44×10^{-4}
AMS71 [2]	–	0.37	0.44×10^{-4}
AMS80 [2][3]	AMS56	0.75	1.3×10^{-4}
AMS90 [2]	AMS143/145	1.5	2.5×10^{-4}
AMS100 [2]	AMS182	3	7.8×10^{-4}
AMS112 [2]	AMS184	4	7.8×10^{-4}
AMS132S/M [2]	AMS213/215	7.5	22×10^{-4}
AMS132ML [2]	–	9.2	22×10^{-4}
AMS160	AMS254/256	15	72×10^{-4}
AMS180	AMS284/286	22	72×10^{-4}
AMS200	AMS324/326	30	201×10^{-4}
AMS225	AMS364/365	45	204×10^{-4}
AMS250	–	55	442×10^{-4}
AMS280	–	90	547×10^{-4}

[1] Maximum rated power of the mounted standard electric motor at 1400 min^{-1}.

[2] An extended adapter is used for certain adapter combinations with parallel-shaft helical gear units (see following table) to avoid collisions with the safety cover. This changes the mass moment of inertia.

[3] $J_{AMS80/VL} = J_{AMS90} = 2.5 \times 10^{-4}$ kg × m²

The specified mass moments of inertia apply for the standard adapter and the adapter with reinforced bearings. An exception is adapter AMS80/VL, which has the same inertia as adapter AMS90. The mass moments of inertia of the adapters with backstop AMS../RS and drain hole AMS../DH can be found in the tables in chapters "Adapter with backstop AMS../RS" (→ 🗎 83) and "Adapter with drain hole AMS../DH" (→ 🗎 84).

Deviating mass moments of inertia for certain adapter combinations with parallel-shaft helical gear units

IEC adapter	Gear unit size	Gear unit safety cover		$J_{Adapter}$
		High fixed plastic safety cover	Fixed tin sheet metal safety cover (standard for TorqLOC® and ATEX)	kg × m²
AMS71	F..37	X	X	0.6×10^{-4}
AMS80	F..37, F..47	X	X	1.8×10^{-4}
	F..57	X	X	
AMS90	F..37; F..47	X	X	3.1×10^{-4}
	F..57	X	X	

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IEC adapter	Gear unit size	Gear unit safety cover		$J_{Adapter}$
		High fixed plastic safety cover	Fixed tin sheet metal safety cover (standard for TorqLOC® and ATEX)	kg × m²
AMS100/112	F..57		X	11 × 10^{-4}
AMS132	F..77		X	31 × 10^{-4}

4.11.6 Adapter with backstop AMS../RS

Check the direction of rotation of the drive prior to assembly or startup. In case of a wrong direction of rotation, contact SEW-EURODRIVE.

The backstop is maintenance-free in operation. Backstops have a minimum lift-off speed depending on the size (see following table).

NOTICE

If the speed is below the minimum lift-off speed of the drive, the backstop is subject to wear and heats up.

Possible damage to property.

- In nominal operation the lift-off speed of the drive must not drop below the specified minimum.
- During startup or braking, the lift-off speed of the drive may drop below the minimum levels.

Adapter		Maximum locking torque of the backstop	Minimum lift-off speed	$J_{Adapter}$
IEC	NEMA	Nm	min^{-1}	kg × m²
AMS80/RS	–	130	720	4.5 × 10^{-4}
AMS90/RS	AMS143/145/RS			
AMS100/RS	AMS182/RS	190	625	15 × 10^{-4}
AMS112/RS	AMS184/RS			
AMS132/RS	AMS213/215/RS	500	550	44 × 10^{-4}
AMS160/RS	AMS254/256/RS	900	515	108 × 10^{-4}
AMS180/RS	AMS284/286/RS			
AMS200/RS	AMS324/326/RS	1900	490	257 × 10^{-4}
AMS225/RS	AMS364/365/RS			
AMS250/RS	–			496 × 10^{-4}
AMS280/RS	–			601 × 10^{-4}

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4.11.7 Adapter with drain hole AMS../DH

The following table shows the maximum permissible rotational speeds and mass moments of inertia for the adapters with the drain hole option (condensation drain hole):

Adapter		Max. permitted speed	$J_{Adapter}$
IEC	NEMA	min^{-1}	$kg \times m^2$
AMS63/71/DH	–	3600	0.6×10^{-4}
AMS80/DH	AMS56/DH	3600	1.8×10^{-4}
AMS90/DH	AMS143/145/DH	3600	3.1×10^{-4}
AMS100/DH	AMS182/DH	3600	11×10^{-4}
AMS112/DH	AMS184/DH	3600	11×10^{-4}
AMS132/DH	AMS213/215/DH	3200	31×10^{-4}
AMS160/DH	AMS254/256/DH	2600	87×10^{-4}
AMS180/DH	AMS284/286/DH	2600	86×10^{-4}
AMS200/DH	AMS324/326/DH	1900	201×10^{-4}
AMS225/DH	AMS364/365/DH	1900	204×10^{-4}
AMS250/DH	–	1900	442×10^{-4}
AMS280/DH	–	1900	547×10^{-4}

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4.11.8 Mounting of third-party motors(s) to AR../AL.. adapters

If a third-party motor is mounted, the customer must ensure that the permitted weight and the power at the adapter are adhered to according to the operating instructions. For information on the permitted loads, refer to chapter "Permitted loads" (→ 🗎 79).

Adapter	x[1)] mm	F_R[1)] N
AR/AL71	77	375
AR/AL80/90	113	320
AR/AL100/112	144	1560
AR/AL132[2)]	186	1230
AR/AL132	186	3630
AR/AL160/180	251	3540

[1)] Maximum load values for connection screws of strength class 8.8. If the center of gravity distance x increases, the maximum permitted weight F_R of the attached motor must be reduced linearly. If the center of gravity distance x decreases, the maximum permitted weight F_R must not be increased.

2) Gear unit input end flange diameter: 160 mm.

4.11.9 Tightening torques for motor to adapter

Screw the motors to the adapters with the following tightening torques. When doing this, observe the tightening torques in chapter "Notes concerning tightening torques" (→ 🗎 34).

Screw size	Strength class	Tightening torque ±15% Nm
M5	8.8	7
M6	8.8	12
M8	8.8	28
M10	8.8	56
M12	8.8	96
M16	8.8	235

4.11.10 AMS.. adapter with attached foot-mounted motor

A foot-mounted motor reduces the loads at the adapter interface. The foot-mounted motor at the adapter must be installed without tension on the customer's construction.

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4.12 AQS.. adapter

4.12.1 Figure and note concerning the installation of the AQS.. adapter

NOTICE

Damage to the adapter due to the ingress of moisture or dirt (e.g. dust) when a motor/drive is attached to the adapter.

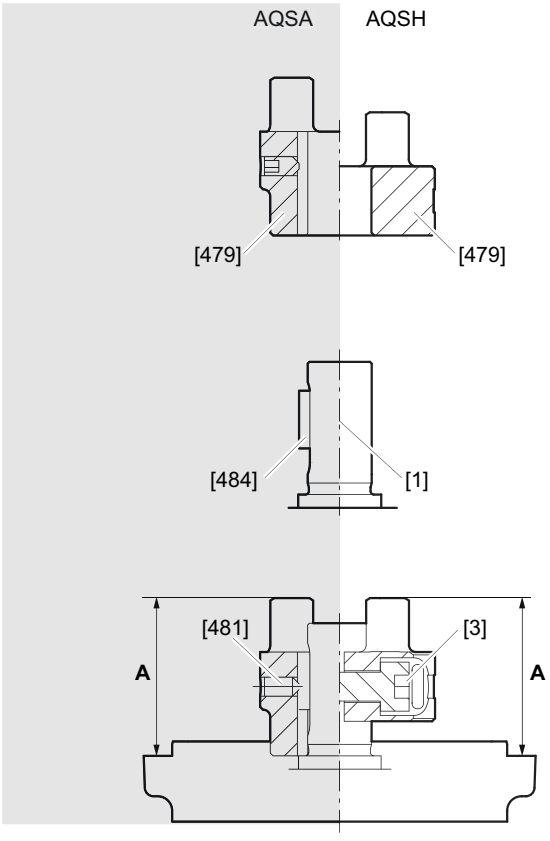
Damage to the adapter.

- Seal the adapter with an anaerobic fluid seal.
- When the motor/drive to be attached has openings or bores that provide access to the inside of the adapter, seal these against dust or liquid.

INFORMATION

With AQSA..: To avoid contact corrosion, SEW-EURODRIVE recommends applying NOCO® fluid to the motor shaft before mounting the coupling half.

With AQSH..: The use of NOCO® fluid is not permitted.



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[1] Motor shaft
[3] Clamping screw
[479] Coupling half
[481] Set screw
[484] Key
A Distance A

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4.12.2 Mounting of motor to adapter AQSH.. with coupling half pre-mounted in adapter

1. Clean the motor shaft [1] and the flange surfaces of the motor and the adapter.
2. Ensure that the clamping screw [3] of the coupling is accessible through the lateral hole in the housing. **Information!** The coupling half [479] is spread apart in the delivery state.
3. Seal the contact surfaces between the adapter and motor using a suitable sealing compound.
4. Fit the motor to the adapter. Adhere to the tightening torques specified in chapter "Tightening torques for motor to adapter" (→ 🗎 85).
5. Tighten the clamping screw of the coupling half. The values for tightening torque "T_A" are listed in the table in chapter "Distances and tightening torques" (→ 🗎 88).
6. Close the lateral holes using the closing plugs.

4.12.3 Mounting of motor to adapter AQSH.. with coupling half pre-mounted to motor shaft

1. Clean the motor shaft [1] and the flange surfaces of the motor and the adapter.
2. Unscrew the clamping screw [3] of the coupling until the screw head is lying against the lateral pin. Then continue turning for half a revolution so that the coupling half [479] is spread apart.
3. Slide the coupling half onto the motor shaft up to distance "A". The values for distance "A" are listed in the table in chapter "Distances and tightening torques" (→ 🗎 88).
4. Check the position of the coupling half. The values for distance "A" are listed in the table in chapter "Distances and tightening torques" (→ 🗎 88).
5. Secure the coupling half to the motor shaft. Tighten the clamping screw of the coupling half. The values for tightening torque "T_A" are listed in the table in chapter "Distances and tightening torques" (→ 🗎 88).
6. Seal the contact surfaces between the adapter and motor using a suitable sealing compound.
7. Mount the motor onto the adapter, making sure that the claws of the two coupling halves engage in each other. Adhere to the tightening torques specified in chapter "Tightening torques for motor to adapter" (→ 🗎 85). **Information!** The amount of mounting force can be reduced by lightly greasing or oiling the coupling ring or the coupling half. To do this, only use mineral oil-based oil or grease without additives.
8. Close the lateral holes using the closing plugs.

⇨ The force that must be applied when joining the two coupling halves is dissipated after final assembly, so there is no risk of any axial load being applied to adjacent bearings.

4.12.4 Mounting of motor to adapter AQSA..

1. Clean the motor shaft [1] and the flange surfaces of the motor and the adapter.
2. Remove the key [484] of the motor shaft. Replace this key with the provided key.
   ⇨ With AQSA80 – AQSA190, the key must not protrude beyond the base of the coupling claw in the installed condition.
3. Heat the coupling half [479] to approx. 80 °C to 100 °C.

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4. Slide the coupling half onto the motor shaft up to distance "A". The values for distance "A" are listed in the table in chapter "Distances and tightening torques" (→ 🗎 88).
5. Check the position of the coupling half. The values for distance "A" are listed in the table in chapter "Distances and tightening torques" (→ 🗎 88).
6. Secure the coupling half and the key to the motor shaft using the set screw [481]. The values for tightening torque "T_A" are listed in the table in chapter "Distances and tightening torques" (→ 🗎 88).
7. Seal the contact surfaces between the adapter and motor using a suitable sealing compound.
8. Mount the motor onto the adapter, making sure that the claws of the two coupling halves engage in each other. Adhere to the tightening torques specified in chapter "Tightening torques for motor to adapter" (→ 🗎 85). **Information!** The amount of mounting force can be reduced by lightly greasing or oiling the coupling ring or the coupling half. To do this, only use mineral oil-based oil or grease without additives.
9. Close the lateral holes using the closing plugs.

⇨ The force that must be applied when joining the two coupling halves is dissipated after final assembly, so there is no risk of any axial load being applied to adjacent bearings.

4.12.5 Distances and tightening torques

Adapter	Ø of coupling bore	Distance A	Screws		Tightening torque T_A Nm	
	mm	mm	AQSA..	AQSH..	AQSA..	AQSH..
AQSA/AQSH50	8	23.3	–	M4	–	4.1
	9		M3		0.6	
AQSA/AQSH80	11	27.3	M4	M5	1	8.1
	14					
AQSA/AQSH100	14	30	M5	M6	2	14
	16					
	19					
AQSA/AQSH115	19	39	M5	M6	2	14
	22		–		–	14
	24		M5		2	14
AQSA/AQSH140	24	48.5	M6	M8	4.8	34
	28					
	32					
AQSA/AQSH160	28	56.5	M8	M10	10	67
	32			M10		
AQSA/AQSH190/1 to 5	35		–	M10	–	
	38		M8	M10	10	
AQSA/AQSH190/6	35	68.5	M8	M10	10	67

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4.12.6 Permitted loads

NOTICE

The gear unit can become overloaded due to excessive weight or the excessive power rating of an attached motor.

Gear unit damage.

- Note that the load data specified in the following table is not to be exceeded.
- Ensure that the permitted power rating (torque and speed) on the adapter is adhered to according to the nameplate.

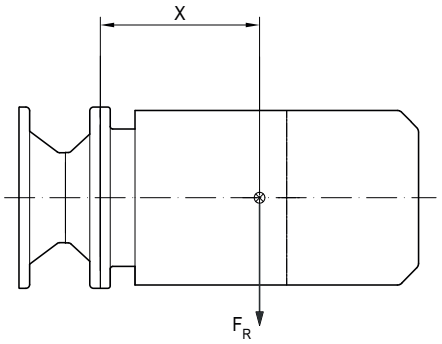
NOTICE

Danger due to static overdetermination if motors are additionally attached via a foot plate.

Damage to property.

- A motor attached at the foot relieves the interface at the adapter; however, make sure that the installed foot-mounted motor is attached to the customer's construction in a stress-free manner.

The following figure shows the load caused by the motor mass:



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⊗ Motor's center of gravity
x Distance from adapter flange to motor's center of gravity
F_R Overhung load

Permitted loads for gear unit series R..7, F..7, K..7, K..9, S..7, S..7p and W..9:

Adapter	x[1)] mm	Flange diameter of gear unit at the input end mm	F_R[1)] N
AQS50	45	≥ 105	200
AQS80	77	105	200
		≥ 120	370
AQS100	113	105	200
		≥ 120	350
AQS115	113	≥ 120	300

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Adapter	x[1)] mm	Flange diameter of gear unit at the input end mm	F_R[1)] N
AQS140	144	120	300
		≥ 160	1550
AQS160	144	≥ 160	1450
AQS190	186	160	1250
		≥ 200	3750

Permitted loads for gear unit type series SPIROPLAN® W..37/47:

Adapter	x[1)] mm	F_R[1)] N
AQS50/80	115	140
AQS100/115	151	265
AQS140	151	265

1) Maximum load values for connection screws of strength class 8.8. If the center of gravity distance x increases, the maximum permitted weight F_R of the attached motor must be reduced linearly. If the center of gravity distance x decreases, the maximum permitted weight F_R must not be increased.

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4.13 EWH adapters

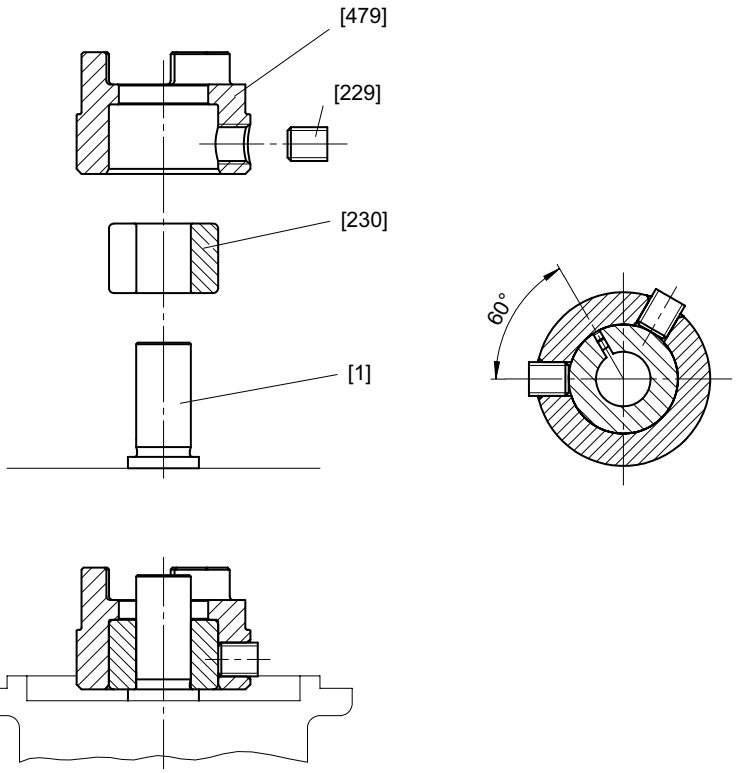
4.13.1 Adapter EWH01 – 03

NOTICE

Damage to the adapter due to the ingress of moisture or dirt (e.g. dust) when a motor/drive is attached to the adapter.

Damage to the adapter.

- Seal the adapter with an anaerobic fluid seal.
- When the motor/drive to be attached has openings or bores that provide access to the inside of the adapter, seal these against dust or liquid.



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[1]	Motor shaft	[230]	Motor shaft sleeve
[229]	Clamping screws	[479]	Coupling half

1. Clean and de-grease the hollow shaft hole of the coupling half [479], the motor shaft sleeve [230], and the motor shaft [1].
2. Insert the motor shaft sleeve [230] into the coupling half [479] so that the slot of the motor shaft sleeve [230] is at a 60° angle to the two clamping screws [229].
3. Push the coupling half [479] until it reaches the shoulder of the motor shaft.
4. Tighten the clamping screws [229] one after the other with a suitable torque wrench, initially to 25% of the tightening torque prescribed in the following table.
5. Tighten the two clamping screws [229] to the full prescribed tightening torque.

Adapter	Motor shaft diameter mm	Number of clamping screws	Clamping screw tightening torque Nm	Wrench size mm
EWH01	9	2	6	3
EWH01	11	2	10	4
EWH02	11, 14, 16	2	10	4
EWH03	11, 14, 16	2	10	4

4.13.2 Permitted loads

NOTICE

Overloading of the gear unit due to excessive weight or excessive power rating of an attached motor.

Gear unit failure

- Note that the load data specified in the following table must not to be exceeded.
- Make sure that the approved power rating (torque and speed) on the adapter is observed according to the nameplate.

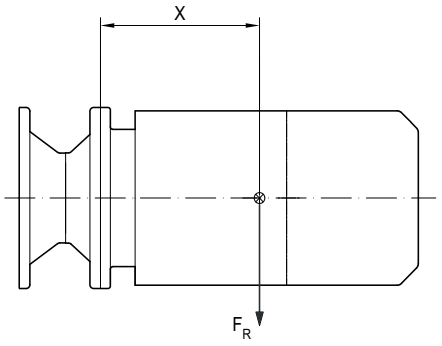
NOTICE

Danger due to static overdetermination when motors are additionally attached via a foot plate.

Damage to property

- A motor attached at the foot relieves the interface on the adapter, but you have to make sure that the attached foot-mounted motor is attached to the customer's construction stress-free.

The following figure shows the load caused by the mass of the motor:



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⊗ Motor center of gravity
x Distance between adapter flange and motor center of gravity
F_R Overhung load

Adapter	x[1)] mm	F_R[1)] N
EWH01	113	40
EWH02	120	56

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Adapter	x[1)] mm	F_R[1)] N
EWH03	120	56

[1)] Maximum load values for connection screws of strength class 8.8. If the center of gravity distance x increases, the maximum permitted weight F_R of the attached motor must be reduced linearly. If the center of gravity distance x decreases, the maximum permitted weight F_R must not be increased.

4.13.3 Tightening torques for motor to adapter

Screw the motors to the adapters with the following tightening torques. When doing this, observe the tightening torques in chapter "Notes concerning tightening torques" (→ 🗎 34).

Screw size	Strength class	Tightening torque ±15% Nm
M5	8.8	7
M6	8.8	12
M8	8.8	28
M10	8.8	56
M12	8.8	96
M16	8.8	235

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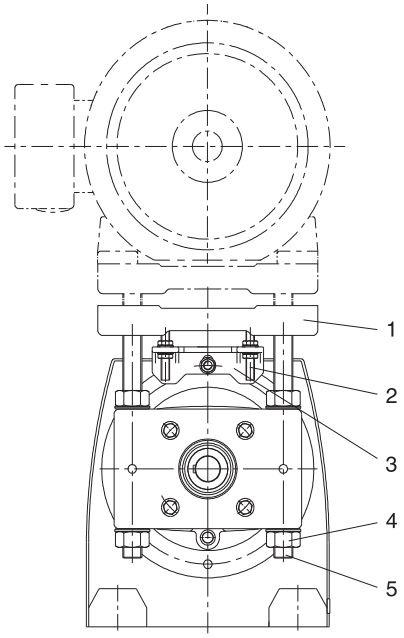
4.14 AD Input shaft assembly

Observe chapter "Mounting the drive components and output elements" (→ 🗎 42) when installing drive components.

4.14.1 Mounting the cover with motor platform AD../P



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[1] Motor platform
[2] Stud bolt (only AD6/P / AD7/P)
[3] Support (only AD6/P / AD7/P)
[4] Nut
[5] Threaded column

To mount the motor and to adjust the motor platform proceed as follows:

1. Set the motor platform [1] to the required mounting position by evenly tightening the adjusting nuts [4].
2. If necessary, remove the lifting eyebolt/lifting eye of the helical gear unit to reach the lowest adjustment position. Touch up any damage to the paint work.
3. Align the motor on the motor platform [1] so that the shaft ends are in line. Attach the motor.
4. Mount the drive components onto the input side shaft end and the motor shaft.
5. Align the drive components, shaft end and motor shaft. If necessary, correct the motor position again.
6. Put on the traction elements (V-belt, chain, etc.) and apply a preload by evenly adjusting the motor platform [1]. Do not stress the motor platform and the columns against each other when doing this.
7. To fasten the threaded columns [5], tighten the nuts [4] that are not used for adjustment.

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4.14.2 Special aspects of AD6/P and AD7/P

Proceed as follows:

1. Unscrew the nuts on the threaded bolts [2] before adjustment to allow the threaded bolts [2] to move axially in the support [3] without restriction.
2. Only tighten the nuts when the final adjustment position is reached.

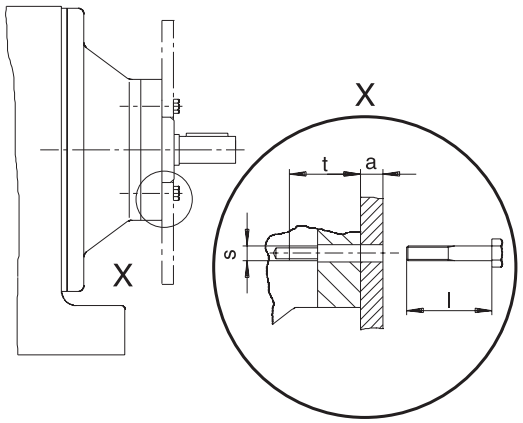
INFORMATION

Do not adjust the motor platform [1] via the support [3].

4.14.3 AD../ZR input shaft assembly with centering shoulder

Mounting applications on the input shaft assembly with centering shoulder

1. Prepare screws of a suitable length for attaching the application. The following figure shows the screw length l = t + a. **Round off the result to the next smaller standard length**.



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a Strength of the additional element
s Retaining thread (see table)
t Screw-in depth (see table)

2. Remove the retaining screw from the centering shoulder.
3. Clean the contact surface and the centering shoulder.
4. Clean the threads of the new screws and apply a thread locking compound (e.g. Loctite® 243) to the first few threads.
5. Place the application on the centering shoulder. Tighten the retaining screws with the specified tightening torque "T_A" (see following table).

Cover	Screw-in depth t mm	Retaining thread	Tightening torque T_A for connection screws in strength class 8.8 Nm
AD2/ZR	25.5	M8	28
AD3/ZR	31.5	M10	56
AD4/ZR	36	M12	96
AD5/ZR	44	M12	96

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Cover	Screw-in depth t mm	Retaining thread	Tightening torque T_A for connection screws in strength class 8.8 Nm
AD6/ZR	48.5	M16	235
AD7/ZR	49	M20	460
AD8/ZR	42	M12	96

Permitted loads

NOTICE

The gear unit can become overloaded due to excessive weight or the excessive power rating of an attached motor.

Gear unit damage.

- Note that the load data specified in the following table is not to be exceeded.
- Ensure that the permitted power rating (torque and speed) on the adapter is adhered to according to the nameplate.

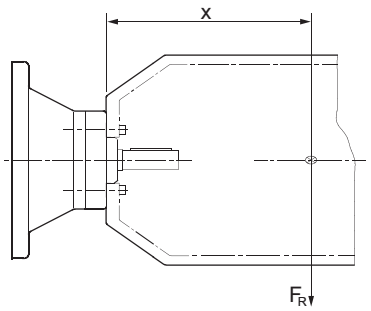
NOTICE

Danger due to static overdetermination if motors are additionally attached via a foot plate.

Damage to property.

- A motor attached at the foot relieves the interface at the adapter; however, make sure that the installed foot-mounted motor is attached to the customer's construction in a stress-free manner.

The following figure shows the load caused by the motor mass:



⊗ Motor's center of gravity
x Distance from adapter flange to motor's center of gravity
F_R Overhung load

Cover	$x^{1)}$ mm	$F_R{}^{1)}$ N
AD2/ZR	193	330
AD3/ZR	274	1400

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Cover	x[1] mm	F_R[1] N
AD4/ZR[2]	361	1120
AD4/ZR		3300
AD5/ZR	487	3200
AD6/ZR	567	3900
AD7/ZR	663	10 000
AD8/ZR	516	4300

1) Maximum load values for connection screws of strength class 8.8. As the center of gravity distance x increases, the maximum permitted weight of the attached motor F_R must be reduced linearly. As the center of gravity distance x decreases, the maximum permitted weight F_R must not be increased.

2) Diameter of the adapter output flange: 160 mm

4.14.4 Cover with backstop AD../RS

NOTICE

If the speed is below the minimum lift-off speed of the drive, the backstop is subject to wear and heats up.

Possible damage to property.

- In nominal operation the lift-off speed of the drive must not drop below the specified minimum.
- During startup or braking, the lift-off speed of the drive may drop below the minimum levels.

Check the direction of rotation of the drive prior to mounting or startup. If the direction of rotation is wrong, consult SEW-EURODRIVE.

The backstop is maintenance-free in operation. Backstops have a minimum lift-off speed depending on the size (see following table).

Cover	Maximum locking torque of the backstop Nm	Minimum lift-off speed min^{-1}
AD2/RS	65	820
AD3/RS	425	620
AD4/RS	850	530
AD5/RS	1450	480
AD6/RS	1950	450
AD7/RS	1950	450
AD8/RS	1950	450

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4.15 Direct mounting of a motor on a gear unit

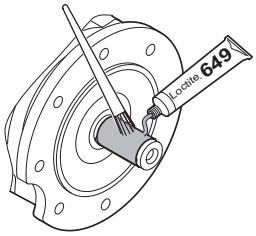
INFORMATION

Secure all the pinions on the motor or input shaft using Loctite® 649, even if a retaining ring is also present.

If the pinion is already secured to the shaft, start cleaning the sealing surface (step 6).

Attaching the pinion onto the motor or input shaft

1. Clean and degrease the shaft and the pinion's bore.
2. Apply Loctite® 649 extensively to the entire surface of the shaft after the groove.



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3. Heat the pinion to **at least** 100 °C up to a **maximum** of 130 °C.
4. Mount the pinion onto the shaft.
5. Secure the pinion onto the shaft using the retaining ring.

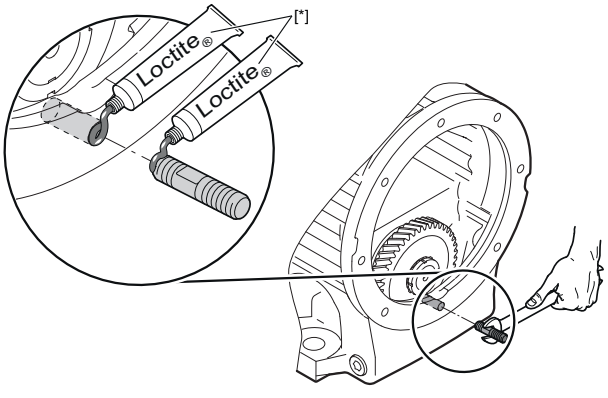
Cleaning the sealing surfaces

6. Remove oil, grease, unevenness, rust, and old Loctite® residues from the flange surfaces.

Sealing threads that lead into the interior of the housing

To prevent oil from leaking after installation, the flange threads that lead into the interior of the housing must be sealed.

7. Clean and degrease the thread through bores that lead into the interior of the housing and their studs.
8. Apply Loctite® 574 or Loctite® 5188 (select according to the table at the end of the chapter) in a continuous ring on the upper threads of the flange thread and the stud.



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[*] Loctite® according to chapter "Selecting and using Loctite®" (→ 🗎 100).

Screwing in the studs

9. Screw the studs into the thread up to the collar.

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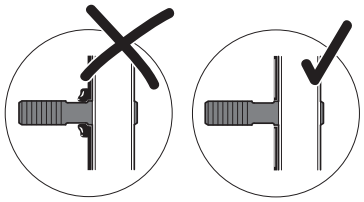
10. Remove excess Loctite® (see the following graphic) from the sealing surface no later than 60 minutes after screwing in.



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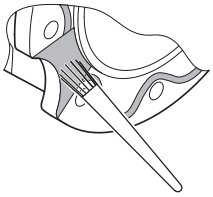
Sealing the flange surface

INFORMATION

Always apply the sealant at constricted openings and in the case of gear units R97, R107, R127, F97 or F107 over an extensive area.



11. Only distribute Loctite® 574 or Loctite® 5188 (select according to the table at the end of the chapter) on one of the sealing surfaces. Apply the sealant seamlessly as a string or over an extensive area. To do so, use a suitable application tool that does not contaminate the sealing surface, e.g. a non-shedding brush or a short-bristled lambswool roller.

Joining the flange surfaces

12. Join the flange surfaces. **Immediately** tighten the nuts using the specified tightening torque (see table below). The sealing film can tear if you tighten the nuts too late.
13. The sealant must harden for 30 minutes and should not touch the gear oil during this time.

4.15.1 Tightening torques

When tightening, observe the tightening torques in chapter "Notes concerning tightening torques" (→ 🗎 34).

Screw/nut	Tightening torque ±15% Nm
M6	12
M8	28
M10	56
M12	96
M16	235

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4.15.2 Selection and use of Loctite®

Sealant	Use	Suitability	Batch size	Part number
Loctite® 649	Joining agent for pinion	All gear units	50 ml	09120998
Loctite® 574	Gasket sealing agent	All gear units except R97 – R127, F97, F107	7 ml	09102558
Loctite® 5188		R97 – R127, F97, F107	50 ml	03207013

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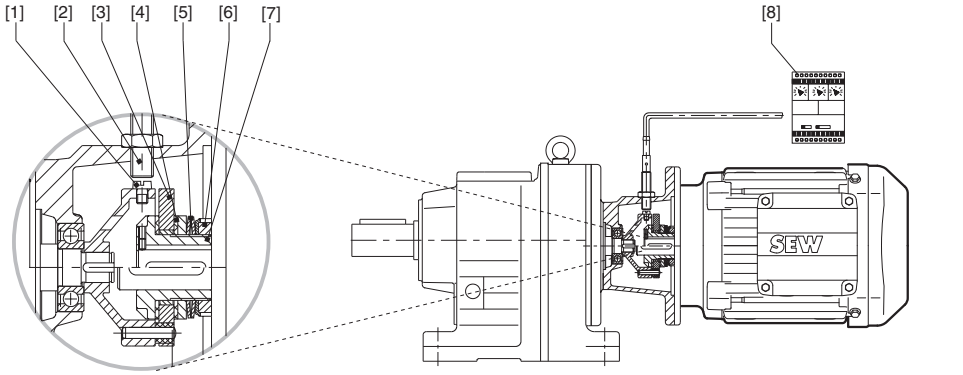
4.16 Accessory equipment

4.16.1 AR.. and AT.. centrifugal and friction couplings

AR.. friction coupling

Drives with a slip clutch consist of a standard toothed gear drive and motor/variable speed gearmotor with an adapter installed between them. This adapter accommodates the slip clutch. In gearmotors with a compound gear unit, the slip clutch may be located between the first and second gear units. On delivery, the slip torque is set individually according to the particular drive design.

The following figure shows a drive with slip clutch and W: speed monitor



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[1] Trip cam
[2] Incremental encoder
[3] Driving disk
[4] Friction lining
[5] Cup spring
[6] Slotted nut
[7] Friction hub
[8] Speed monitor

W speed monitor:

The speed monitor is used with constant-speed gearmotors and is connected to the incremental encoder in the adapter.

WS slip monitor:

The slip monitor is used with the following components:

- Speed-controlled motors with speed sensor
- VARIBLOC® variable-speed gear unit

INFORMATION

For further information about the AR.. coupling, refer to the "Start-up coupling and slip clutch AR.. and AT.." operating instructions.

AT.. hydraulic centrifugal coupling

Hydraulic start-up couplings are fluid couplings based on the Föttinger principle. They consist of 2 hinged hemispheres with blades separated by a tight gap.

The applied torque is transmitted by the inertial force of the streaming fluid. This fluid circulates within a closed circuit, between the pump wheel (primary side) [12] on the driving shaft (motor shaft) and the turbine wheel (secondary side) [9] on the driven shaft (gear unit input shaft).

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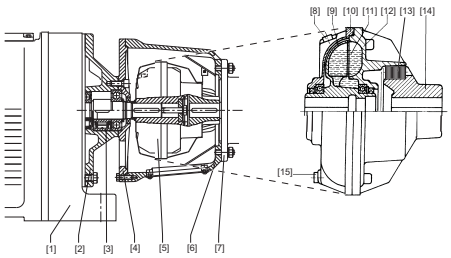
The following figure shows the structure of a drive with hydraulic start-up coupling:



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[1]	Gear unit	[6]	Extended housing complete	[11]	Operating fluid (hydraulic oil)
[2]	Basic flange complete	[7]	Motor	[12]	Pump wheel
[3]	Backstop (optional)	[8]	Filling plugs	[13]	Elastic components
[4]	Intermediate flange	[9]	Turbine wheel	[14]	Flexible connection coupling

INFORMATION

For detailed information about the AT.. coupling, refer to the "Start-up coupling and slip clutch AR.. and AT.." operating instructions.

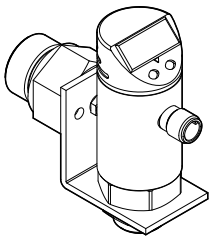
4.16.2 Diagnostic units /DUV and /DUO

/DUO diagnostic unit

DUO10A comprises a diagnostic unit and a temperature sensor. The temperature sensor (PT100 or PT1000 resistance sensor) is positioned in the gear unit oil to record the oil's temperature. The diagnostic units uses the oil temperature values to calculate the remaining service life of the oil.

The diagnostic unit continuously records the gear unit temperature and calculates the remaining service life for the selected oil type immediately. For this purpose, the diagnostic unit must be supplied with a 24 V voltage supply. Times when the diagnostic unit is switched off are not included in the forecast.

The following figure shows the DUO10A diagnostic unit:



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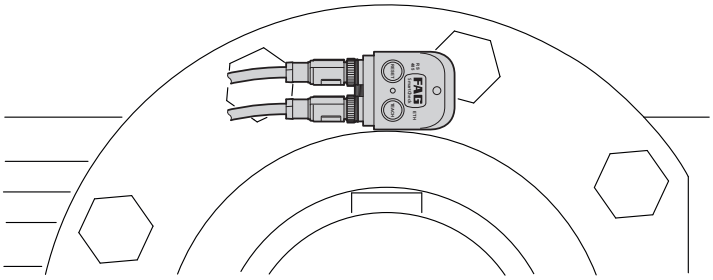
INFORMATION

For further information on the evaluation unit, refer to the manual "DUV30A Diagnostic Unit".

DUV40A (Diagnostic Unit Vibration)

The DUV40A vibration monitoring system is used for early detection of damage to gear units and gearmotors (e.g. bearing damage or imbalance). Permanent frequency-selective monitoring of the gearmotor is used for this purpose. Apart from the vibration analysis, additional measured values of up to 3 signal encoders can be detected, recorded and analyzed. The additional signals can be used as reference values for signal analysis e.g. to trigger time or event-based measuring tasks. After the analysis and depending on user-defined alarm limits, the system can switch outputs and display the state using LEDs.

DUV40A is configured using the SmartWeb software. If you use several Vibration SmartCheck systems, you can control them centrally from one PC using the SmartUtility Light software.



INFORMATION

For more information about DUV40A, refer to the "Diagnostic Unit Vibration" manual, part No.: 29190258/DE.

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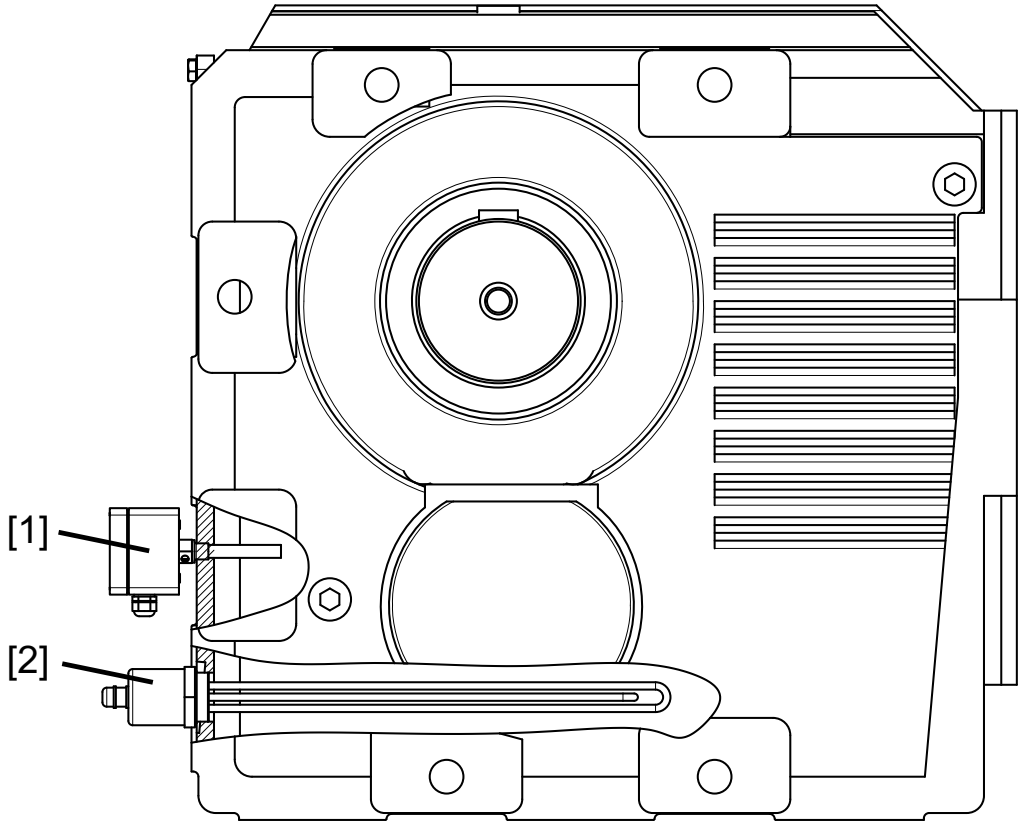
4.16.3 Gear unit heater for gear unit series R..7, F..7, and K..7

An oil heating can be required in order to allow for a smooth startup in the event of a cold start at low ambient temperatures. An oil heating is available with an external or an integrated thermostat depending on the gear unit design.

The heater is screwed into the gear unit housing and is controlled via a thermostat. The limit temperature of the thermostat below which the oil must be heated, is set depending on the respective lubricant.

The following figure shows a gear unit with heater and external thermostat:



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[1] Thermostat [2] Heater

INFORMATION

For further information regarding gear unit heaters, refer to the addendum "Gear unit heaters for gear unit series R..7, F..7 and K..7" to the operating instructions "Gear unit series R..7, F..7, K..7, K..9, S..7, SPIROPLAN® W".

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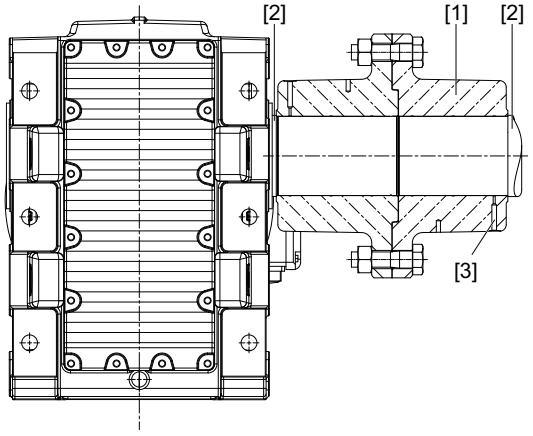
4.16.4 Flange coupling

Flange couplings [1] are rigid couplings for connecting 2 shafts [2].

Flange couplings are suitable for operation in both directions of rotation, but cannot compensate any shaft misalignments.

Torque between shaft and coupling is transmitted via a cylindrical interference fit. The two coupling halves are mounted together at the flanges. The couplings are equipped with several disassembly bores [3] for removing the interference fit hydraulically.



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[1] Rigid flange coupling
[2] Customer and gear shaft
[3] Disassembly bores

INFORMATION

For detailed information about the flange coupling, refer to the "Gear Unit Model Series R..7, F..7, K..7, S..7, and SPIROPLAN® W flange coupling" addendum to the operating instructions.

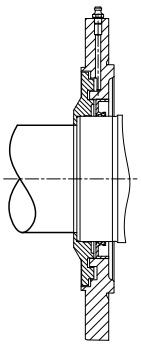
4.16.5 Regreasing the labyrinth seal

Labyrinth seals are used to protect the oil seal in case of very high dust load or other abrasive substances.

Output shaft

The following figure shows an example of a regreasable radial labyrinth seal (taconite).

- Single oil seal with radial labyrinth seal
- Used in **very dusty** environments with abrasive particles



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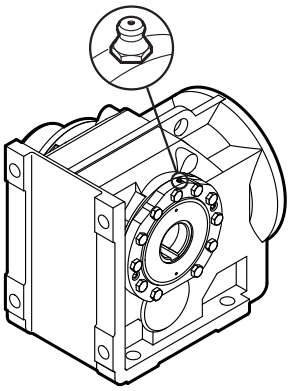
INFORMATION

The gear shaft must rotate during relubrication.

Position of greasing points

Regreasable sealing systems are usually equipped with taper greasing nipples according to DIN 71412 A. Regreasing must be carried out at regular intervals. The greasing points are located near the output shaft, see following figure:



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Refilling grease

Regreasable sealing systems can be refilled with lubricating grease. Use moderate pressure to force grease into each lubrication point until new grease leaks out of the sealing gap.

Used grease, including contaminants and sand, is in this way pressed out of the sealing gap.

INFORMATION

Immediately remove the old grease that leaked out.

Inspection and maintenance intervals

Observe the following inspection and maintenance intervals for the regreasing of labyrinth seals:

Time interval	What to do?
Every 3000 operating hours, at least every 6 months	Fill regreasable sealing systems with grease.

Technical data

Sealing and rolling bearing grease

This table shows the lubricants recommended by SEW-EURODRIVE:

Operating range	Ambient temperature	Manufacturer	Type
Standard	-40 °C to +80 °C	SEW-EURODRIVE	Grease HL 2 E1[1)]
		Fuchs	Renolit CX-TOM 15[1)]
		Klüber	Petamo GHY 133 N
[2)]	-40 °C to +40 °C	SEW-EURODRIVE	Grease HL 2 H1 E1
		Bremer & Leguil	Cassida Grease GTS 2
[3)]	-20 °C to +40 °C	Fuchs	Plantogel 2S

1) Bearing grease based on semi-synthetic base oil.
2) Lubricant for the food processing industry.
3) Readily biodegradable lubricant for environmentally sensitive areas.

INFORMATION

The following grease quantities are required:

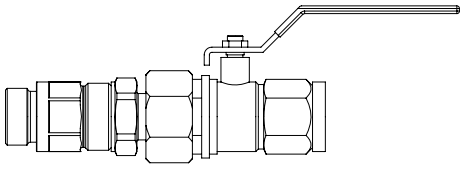
- **For fast-running bearings (gear unit input side):** Fill the cavities between the rolling elements one-third full with grease.
- **For slow-running bearings (gear unit output side):** Fill the cavities between the rolling elements two-thirds full with grease.

INFORMATION

If a customer wants to use a grease that is not listed in the above table, the customer has to make sure that it is suitable for the intended application.

4.16.6 Oil drain valve

The gear unit is equipped with an oil drain plug as standard. An oil drain valve that enables attaching a drain pipe for changing the gear unit oil can optionally be installed.



4984750475

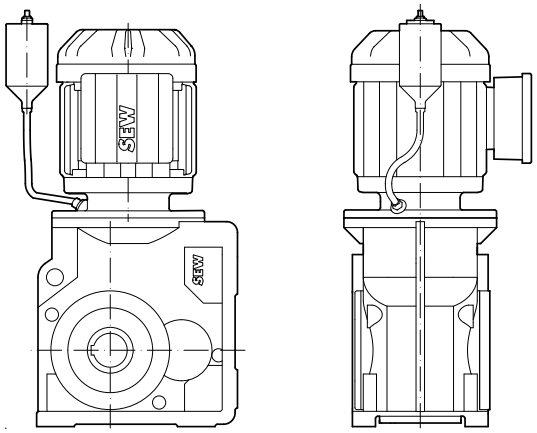
4.16.7 Oil expansion tank

The oil fill level for gear units in mounting position M4 is set due to technical reasons. In case of unfavorable circumstances, oil may leak from the breather valve of these gear units. Use an oil expansion tank to reliably prevent oil from leaking. The oil expansion tank provides additional space for the lubricant to expand.

SEW-EURODRIVE recommends using an oil expansion tank for gear units and gearmotors in mounting position M4, in the following cases:

- For input speeds > 2000 min^{-1}
- For sizes 77 to 97 and input speeds > 1800 min^{-1}
- For gear units and gearmotors from size 107

The following figure shows the oil expansion tank mounted to a gear unit.



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The oil expansion tank is delivered as an assembly kit for mounting onto the gearmotor. In case of limited space or of gear units without motor, the oil expansion tank can also be mounted to nearby machine parts.

INFORMATION

Transverse acceleration is not permitted for gear units with expansion tanks with fixed piping for third-party motors and for servomotors.

If you require further information, contact SEW-EURODRIVE.

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4.16.8 Oil-air cooler for splash lubrication /OAC

If the thermal rating of the naturally cooled gear unit is not sufficient, an oil-air cooling system can be used.

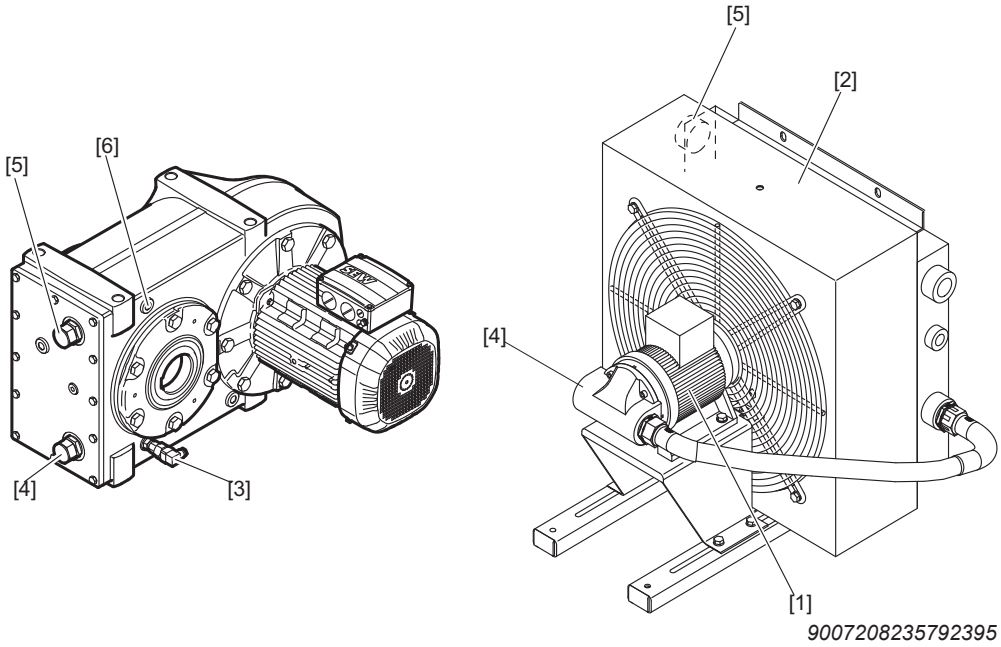
The cooling system is delivered without electrical wiring and piping as a complete unit on a base frame for separate installation.

The standard scope of delivery of the cooling system includes:

- Pump with directly mounted asynchronous motor
- Oil-air heat exchanger
- Temperature switch with 2 switching points

SEW-EURODRIVE uses oil-air cooling systems for standard gear units in sizes OAC 005 and OAC 010.

The following figure shows an example of a standard parallel-shaft helical gear unit next to an oil-air cooler.



9007208235792395

[1]	Motor for pump and fan	[4]	Suction pipe connections
[2]	Oil-air heat exchanger	[5]	Pressure pipe connections
[3]	Temperature switch with 2 switching points	[6]	Option: Oil expansion tank connection

INFORMATION

For more information on the cooling system, refer to the addendum to the operating instructions "Gear unit series R..7, F..7, K..7, K..9, S..7 and SPIROPLAN® W: Oil-air cooler for splash lubrication /OAC".

4.16.9 Agitator design

Relubrication of the agitator design

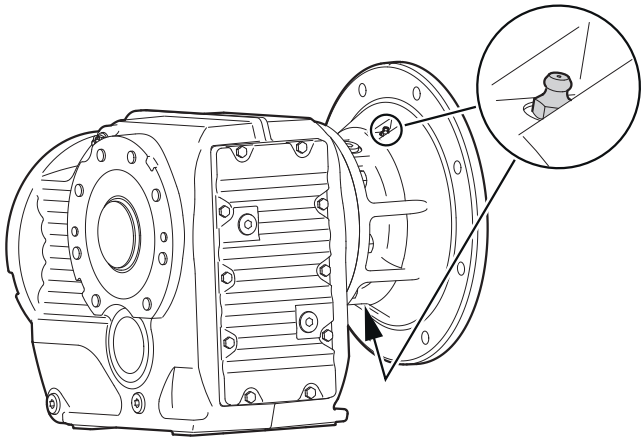
A relubrication of the output shaft bearing is offered as an option for the agitator drives FM.., FAM.., KM.. and KAM...

Position of greasing points

INFORMATION

The gear shaft must turn during the relubrication procedure.

Regreasable sealing systems are usually equipped with taper greasing nipples according to DIN 71412 A. The following figure shows the position of the greasing points:



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Maintenance interval and grease quantities

Regrease the agitator after 10 000 operating hours. The number of regreasing procedures is limited to 5×. Observe the information on the required grease quantities in the following table:

Size	Grease quantity for regreasing g
67	5
77	11
87	11
97	16
107	35
127	34
157	46

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This table shows the lubricants recommended by SEW-EURODRIVE:

Operating range	Ambient temperature	Manufacturer	Type
Standard	-40 °C to +80 °C	SEW-EURODRIVE	Grease HL 2 E1[1)]
		Fuchs	Renolit CX-TOM 15[1)]
		Klüber	Petamo GHY 133 N
[2)]	-40 °C to +40 °C	SEW-EURODRIVE	Grease HL 2 H1 E1
		Bremer & Leguil	Cassida Grease GTS 2
[3)]	-20 °C to +40 °C	Fuchs	Plantogel 2S

1) Bearing grease based on semi-synthetic base oil.
2) Lubricant for the food processing industry.
3) Readily biodegradable lubricant for environmentally sensitive areas.

INFORMATION

If a customer wants to use a grease that is not listed in the above table, the customer has to make sure that it is suitable for the intended application.

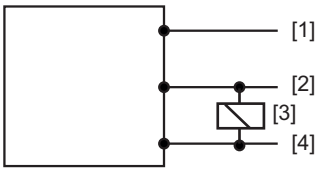
Leak sensor (Drywell design) with the agitator design

A Drywell design with level sensor is optionally available for FM.., FAM.., KM.. and KAM.. agitator drives.

One of the two following sensors is used, depending on the gear unit size:

Level sensor for sizes 67 – 97

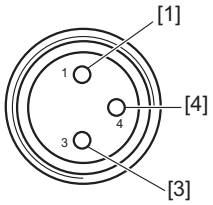
Electrical connection



23527583115

[1] DC 12 V – 32 V
[2] Output
[3] Load
[4] 0 V

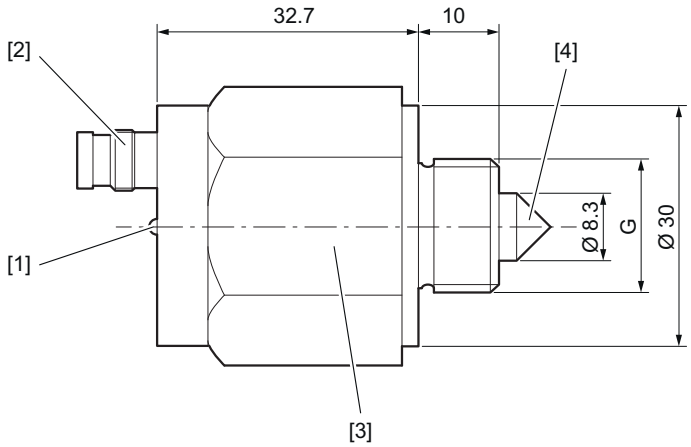
Pin assignment



23527590411

[1] DC 12 V – 32 V
[4] Output
[3] Load

Dimensions



23563256075

[1] LED function indicator
[2] M8×1 circular connector; 3-pin (alternatively cable connection)
[3] Wrench size: 30
[4] Glass prism

Technical data

Measuring accuracy	± 0.5 mm
Minimum distance of the glass tip to an opposite surface	≥ 10 mm
Mounting position	Any
Optical display of the switching status	1 LED
Process connection	Male thread G 3/8", G 1/2" or M12 × 1

For further information, contact SEW-EURODRIVE.

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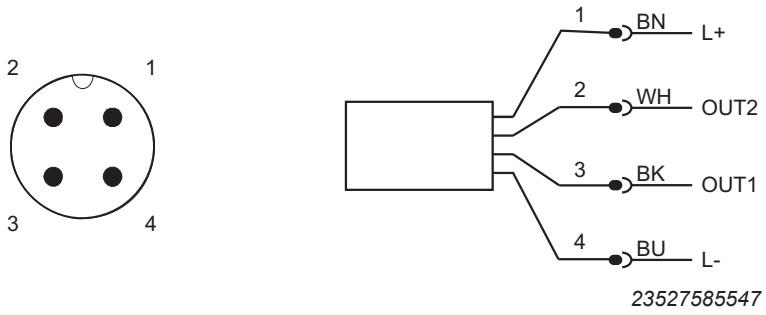
Level sensor for sizes 107 – 157

Electrical connection

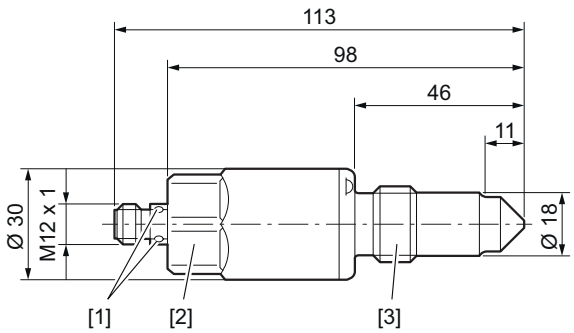
M12 plug-in connector:



23527585547

OUT1: Switching output/IO link/teach
OUT2: Switching output

Dimensions



23563253643

[1] LED
[2] Tightening torque 20 – 25 Nm
[3] G 1/2

Tightening torque 20 – 25 Nm

Technical Data

- Plug-in connection
- Process connection G 1/2 A
- Gold-plated contacts
- 2 switching outputs

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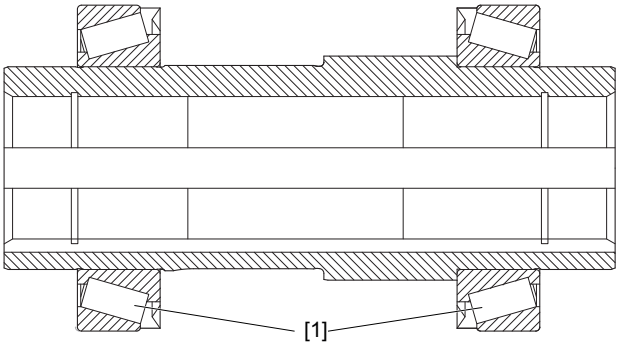
4.16.10 Reinforced hollow shaft bearing

With the reinforced hollow shaft bearing, the standard deep groove ball bearings are replaced with tapered roller bearings. This measure enables considerably higher overhung and axial loads and at the same time an increased service life of the bearings. Contact SEW-EURODRIVE for additional information.



[1] Tapered roller bearing

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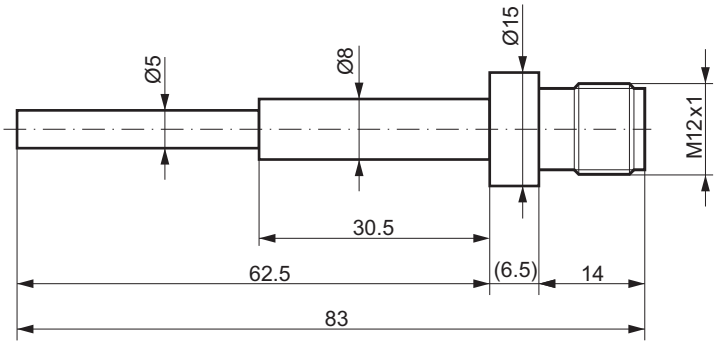
4.16.11 PT1000 temperature sensor

PT1000 dimension drawing



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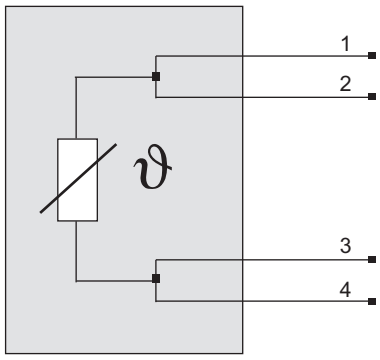
PT1000 technical data

Technical data	Value
Rod length	62.5 mm
Measuring range	-40 to 130 °C
Permitted oil temperature	-40 to 130 °C
Accuracy	± (PT1000 + 0.2 K)
Measuring element	1 × PT1000 to DIN EN 60751, class B, 4-wire connection
Dynamic response T05/T09 (s)	3/8 to DIN EN 60751
Ambient temperature	-25 to 80 °C
Degree of protection, protection class	IP67, III
Housing materials	V4A (1.4404)
Materials in contact with the medium	V4A (1.4404)
Connection	M12 plug-in connection; gold-plated contacts

PT1000 connection diagram



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5 Startup

⚠ CAUTION

Damage to the gear unit due to improper startup.

Possible damage to property.

- Observe the following information.

- Check that the oil level is correct before startup, see chapter "Inspection/maintenance of the gear unit" (→ 🗎 129).
- The oil level plugs and oil drain plugs, as well as the breather plugs and breather valves, must be freely accessible.
- Observe the maximum and rms values of project planning during startup of gear units with servomotor. The buyer is obliged to make the data available to the end user.
- The most important technical data is provided on the nameplate. Additional data relevant for operation is available in drawings and the order confirmation.
- After gear unit setup, ensure that all retaining screws are tight.
- Make sure that the alignment has not changed after tightening the mounting elements.
- Prior to startup, ensure that rotating shafts and couplings are equipped with suitable protection covers.
- If the gear unit has an oil sight glass to monitor the oil level, the oil sight glass must be protected against damage.
- It is essential that there is no open fire or risk of sparks when working on the gear unit.
- Protect the gear unit from falling objects.
- Remove any available transport protection prior to startup.
- Strictly observe the safety notes in the individual chapters.

5.1 Inverter-operated gearmotors

For gear units with servomotor, the maximum and r.m.s. values of project planning must be observed during startup. The buyer is obliged to make the data available to the user.

5.2 Checking the oil level

Before startup, make sure that the oil level corresponds to the mounting position. Observe chapter "Checking the oil level and changing the oil" (→ 🗎 129).

If the gear unit is equipped with an oil sight glass, you can also determine the oil level at the oil sight glass.

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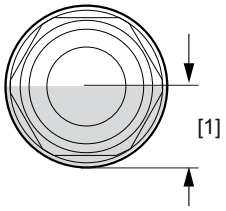
NOTICE

Damage to the gear unit due to oil leaking from the damaged oil sight glass.

Possible unit damage.

- Attach a protective device to prevent the oil sight glass from being damaged by mechanical impacts.

1. Check the oil level at the oil sight glass according to the following figure:



4158756363

[1] The oil level must be within this range.

2. Proceed as follows if the oil level is too low:
   - Open the respective oil fill plug; see chapter "Inspection/maintenance of the gear unit" (→ 🗎 129).
   - Fill in new oil of the same type up to the mark via the oil fill plug.
   - Screw in the oil fill plug.

5.3 Pseudo-leakage at shaft seals

Due to their operating principle, seals between moving surfaces at shaft passages cannot be completely tight, as a lubricant film must form during operation. The lubricant film between shaft and sealing lip keeps the build-up of heat and wear on the sealing system to a minimum and ensures the intended service life. The optimum sealing properties are only achieved after the run-in phase.

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5.4 Helical-worm and SPIROPLAN® W.. gear units

5.4.1 Run-in period

SPIROPLAN® W..0-, SPIROPLAN® W..7 and helical-worm gear units require a run-in period of at least 48 hours before reaching their maximum efficiency. A separate run-in period applies for each direction of rotation if the gear unit is operated in both directions of rotation. The table shows the average power reduction during the run-in period.

Helical-worm gear units

	Worm	
	i range	**η reduction**
1-start	approx. 50 – 280	approx. 12%
2-start	approx. 20 – 75	approx. 6%
3-start	approx. 20 – 90	approx. 3%
4-start	–	–
5-start	approx. 6 – 25	approx. 3%
6-start	approx. 7 – 25	approx. 2%

SPIROPLAN® gear units

Gear units of the type series SPIROPLAN® W..9 are not subject to the run-in behavior because the gear ratios in the SPIROPLAN® stage are smaller and therefore have a very small amount of sliding.

W..10/W..20/W..30		W..37/W..47	
i range	**η reduction**	**i range**	**η reduction**
approx. 35 to 75	approx. 15%		
approx. 20 to 35	approx. 10%		
approx. 10 to 20	approx. 8%	approx. 30 to 70	approx. 8%
approx. 8	approx. 5%	approx. 10 to 30	approx. 5%
approx. 6	approx. 3%	approx. 3 to 10	approx. 3%

5.4.2 Helical-worm gear unit with projecting worm shaft

⚠ CAUTION

Risk of injury due to rotating parts

Injury

- Before you operate the helical-worm gear unit using the inserted handwheel or the hand crank, de-energize the drive.
- If the handwheel or the hand crank remains attached to the shaft during operation, take appropriate measures to prevent injuries.

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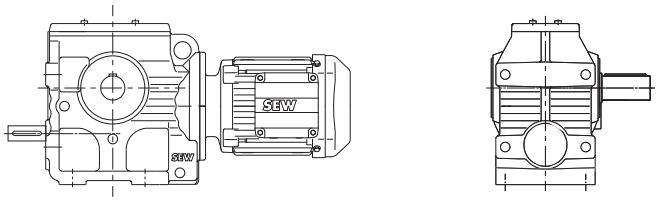
The following figure shows a helical-worm gearmotor with projecting worm shaft:



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5.5 Helical/parallel-shaft helical/helical-bevel gear units

If the gear units were installed according to chapter "Mechanical installation" (→ 26), no special startup notes must be observed for helical, parallel-shaft helical and helical-bevel gear units.

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5.6 Gear units with backstop

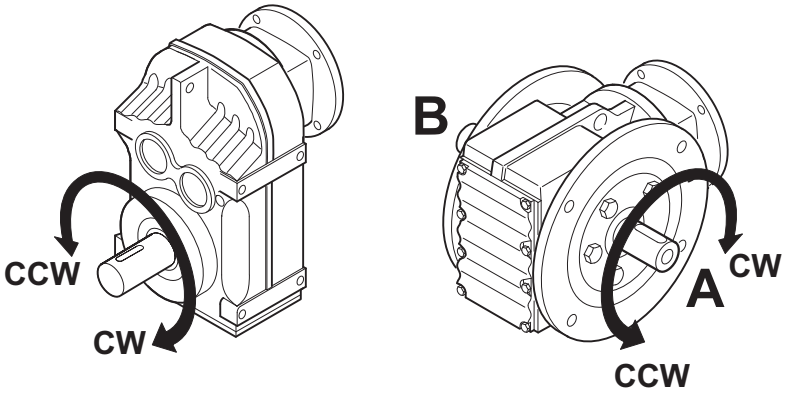
NOTICE

Operating the motor in the blocking direction could destroy the backstop.

Possible damage to property.

- Do not start up the motor in the blocking direction. Before motor startup, make sure the current supply of the motor for the direction of rotation is connected accordingly.
- For control purposes, operation in blocking direction with half the output torque is permitted once.

The purpose of a backstop is to prevent undesirable reverse rotation. During operation, the backstop permits rotation only in the specified direction.



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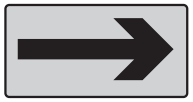
The permitted direction of rotation is indicated by a direction arrow on the housing:



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A replacement label is enclosed for the customer.

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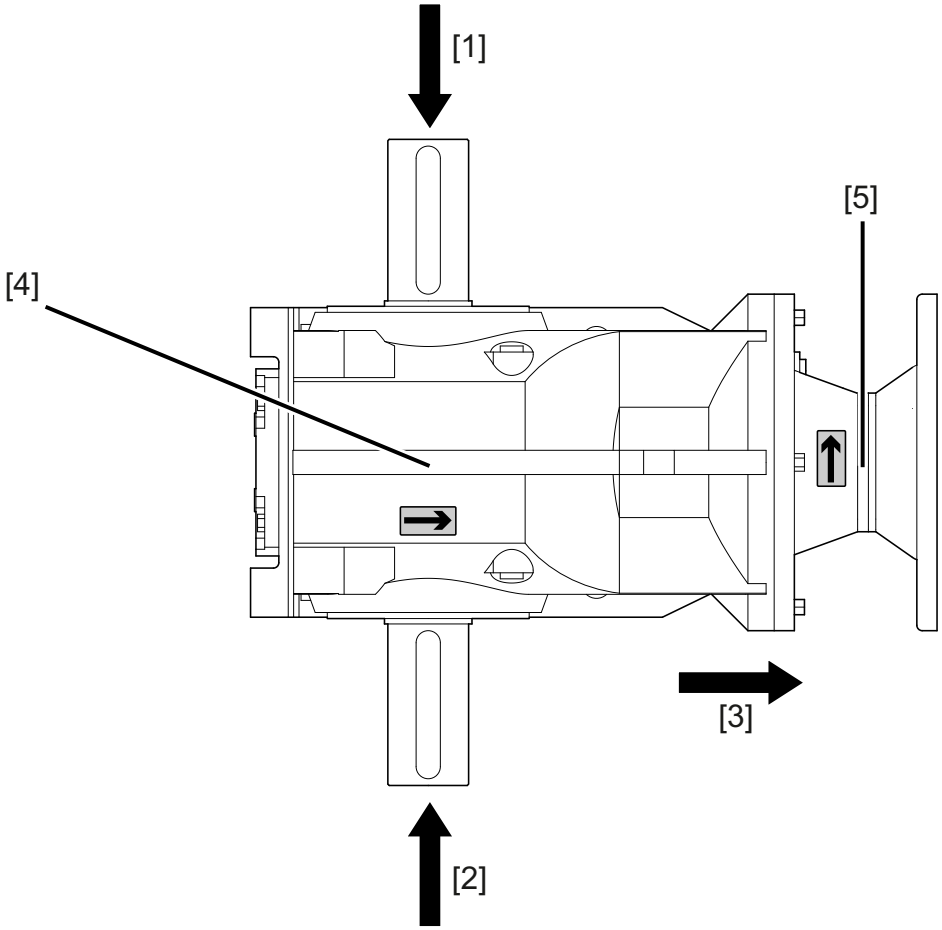
In right-angle gear units, you also have to indicate whether the direction of rotation is given looking onto the A or B-side.



16117549579

[1] Viewing direction for direction of rotation, output B
[2] Viewing direction for direction of rotation, outputs A and A+B
[4] Gear unit
[3] Viewing direction for direction of rotation, input end
[5] Adapter/cover with RS option

5.7 Components made of elastomers with fluorocarbon rubber

⚠ CAUTION

Health risk due to dangerous gases, vapors, and residue created by heating fluorocarbon rubber to > 200 °C.

Damage to health.

- Make sure that components made of fluorocarbon rubber are not exposed to temperatures > 200 °C. Remove the components, if necessary.
- Avoid inhaling fluorocarbon rubber gases and vapors as well as skin and eye contact.
- Avoid contact with the cooled-down fluorocarbon rubber, as dangerous residue has formed while it was heated.

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Under normal operating conditions and at temperatures up to 200 °C, fluorocarbon rubber is very stable and safe. However, when heated to more than 300 °C, e.g. by fire or the flame of a cutting torch, fluorocarbon rubber forms harmful gases and vapors as well as residue.

The following components of R..7, F..7, K..7, K..9, S..7, and SPIROPLAN® W gear units can contain elastomers made of fluorocarbon rubber:

- Oil seals
- Breather valve
- Screw plugs

The user is responsible for safe handling during the service life including eco-friendly disposal.

SEW-EURODRIVE is not responsible for damage caused by improper handling.

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6 Inspection/maintenance

⚠ WARNING

Risk of injury if the drive starts up unintentionally.

Severe or fatal injuries.

- Disconnect the drive from the power supply before you start working on the unit.
- Prevent the drive from starting up unintentionally for example, by locking the key switch or removing the fuses from the current supply, and attach a warning sign that prohibits switching on the drive.

⚠ WARNING

Risk of injury if preloaded shaft connections are loosened.

Severe or fatal injuries.

- Before releasing any shaft connections, make sure there is no active torsional torque present that could lead to tension within the system.

⚠ WARNING

Risk of burns due to hot gear unit and hot gear unit lubricant.

Severe injuries.

- Let the gear unit cool down before you start working on it.
- Carefully remove the oil level plug and the oil drain plug.

NOTICE

Loss of lubricant qualities due to filling of wrong lubricant.

Damage to the gear unit.

- Do not mix synthetic lubricants and mineral lubricants.
- Do not mix different synthetic lubricants.

NOTICE

Damage to oil seal caused by cleaning the gear unit with a high pressure device.

Gear unit damage.

- Do not clean the gear unit with a high-pressure cleaning device.

NOTICE

Damage to gear unit due to ingress of foreign objects during maintenance and inspection work.

Gear unit failure.

- Prevent foreign particles from entering into the gear unit during maintenance and inspection work.

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INFORMATION

Maintain the inspection and maintenance intervals. This is necessary to ensure operational safety.

INFORMATION

Perform a safety check and functional check following maintenance and repair work.

6.1 Wearing parts

Gearing

If you observe the SEW-EURODRIVE design criteria and the inspection and maintenance intervals, then the gearing components of the gear units will be wear-free after the run-in period. The worm gearing is an exception for design reasons. Depending on the operating conditions, material on the tooth flanks of the worm gear is removed to different extents. The main influencing factors are:

- Rotational speed
- Load
- Operating temperature
- Lubricant (type, viscosity, additives, pollution)
- Switching frequency

For information on the worm gearing service life under certain operating conditions, contact SEW-EURODRIVE.

Rolling bearings

Rolling bearings in the gear unit, adapter, and input shaft assembly have a limited service life, even under ideal operating conditions. This nominal bearing service life is a solely statistical value. The actual service life of an individual bearing may deviate greatly from this value. The main influencing factors are:

- Rotational speed
- Equivalent bearing load
- Operating temperature
- Lubricant (type, viscosity, additives, pollution)
- Lubricant supply of the bearing
- Misalignment under operating load

Therefore the rolling bearings must be inspected regularly. Observe the corresponding inspection and maintenance intervals in the chapters "Inspection/maintenance intervals" (→ 🗎 126), "Lubricant change intervals" (→ 🗎 127), "Maintaining adapter AL../AMS../AQS../EWH.." (→ 🗎 128) and "AD.. input shaft assembly maintenance" (→ 🗎 128).

For information on the nominal bearing service life under certain operating conditions, contact SEW-EURODRIVE.

Lubricants

Lubricants are subject to aging. Their service life is limited depending on the load conditions.

The service life depends significantly on the oil operating temperature. The dependency of lubricant change intervals on the operating temperature is depicted in the figure in chapter "Lubricant change intervals" (→ 🗎 127).

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Oil seals

Oil seals are contact seals that seal unit housings at emerging elements, such as shafts, from the environment. Oil seals are wear parts with a service life that is influenced by the following factors, among others:

- Shaft speed and circumferential speed at the sealing lip
- Ambient conditions (temperature, dust, humidity, pressure, chemicals, radiation)
- Lubricant (type, viscosity, additives, pollution)
- Surface quality of the sealing
- Lubricant supply of the sealing
- Oil seal material

Due to the various influencing factors, it is not possible to predict the service life. Therefore the oil seals must be inspected regularly. Observe the corresponding inspection and maintenance intervals in the chapters "Inspection/maintenance intervals" (→ 🗎 126), "Lubricant change intervals" (→ 🗎 127), "Maintaining adapter AL../AMS../AQS../EWH.." (→ 🗎 128) and "AD.. input shaft assembly maintenance" (→ 🗎 128).

Coupling ring

The couplings installed in the AMS.., AL.., AQS... and EWH.. adapters are designed to be positive, puncture-proof and low-maintenance claw couplings with an impact and vibration-absorbing cam ring (AMS.., EWH..) or coupling ring (AQS..., AL..). The service life is determined by the following factors, among others:

- Ambient conditions (temperature, chemicals, radiation)
- Operational conditions (switching frequency, impact characteristics)

Adhere to the corresponding inspection and maintenance intervals in chapter "Maintaining adapter AL../AMS../AQS../EWH.." (→ 🗎 128).

Rubber buffer

The rubber buffer is required for shaft-mounted gear units of the F and W gear unit types for torque support. Rubber buffers are wear parts with a service life that is influenced by the following factors:

- Load
- Ambient conditions
  - Temperature
  - Humidity
  - Aggressive chemicals, e.g. ozone
- Switching frequency
- Impact characteristics

Flexible bushing

A so-called flexible bushing is required for the torque bracket of the S and K gear unit types. Flexible bushings are wear parts with a service life that is influenced by the following factors:

- Load
- Ambient conditions
  - Temperature
  - Humidity
  - Aggressive chemicals, e.g. ozone
- Switching frequency
- Impact characteristics

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6.2 Inspection/maintenance intervals

The following table lists the obligatory intervals and the corresponding measures:

Time interval	What to do?
• Every 3000 operating hours, at least every 6 months	• Check oil and oil level • Check running noise for possible bearing damage • Visual inspection of the seals for leakage • Check that all screw plugs, any oil sight glass, the breather valve, and the gear unit cover screws are tight. • For gear units with a torque bracket: Check and replace the rubber buffers, if necessary
With mineral oil: • Depending on the operating conditions (see illustration in chapter "Lubricant change intervals" (→ 🖹 127)), every 3 years at the latest • According to oil temperature	• Change the oil • Replace rolling bearing grease (recommendation) • Replace oil seal (do not install it in the same track again)
With synthetic oil: • Depending on the operating conditions (see illustration in chapter "Lubricant change intervals" (→ 🖹 127)), every 5 years at the latest • According to oil temperature	• Change the oil • Replace rolling bearing grease (recommendation) • Replace oil seal (do not install it in the same track again)
• Varying (depending on external factors)	• Touch up or renew the surface/ anti-corrosion coating • Check operation of breather valve (if present)
• From 5th year of operation	• Check the blocking effect of the backstop annually. Ensure that the maximum blocking torque is not exceeded.

Exceptions

The following gear units are lubricated for life. A scheduled oil change is not necessary:

- R..07, R..17, R..27 helical gear units
- F..27 parallel-shaft helical gear unit
- SPIROPLAN® gear units

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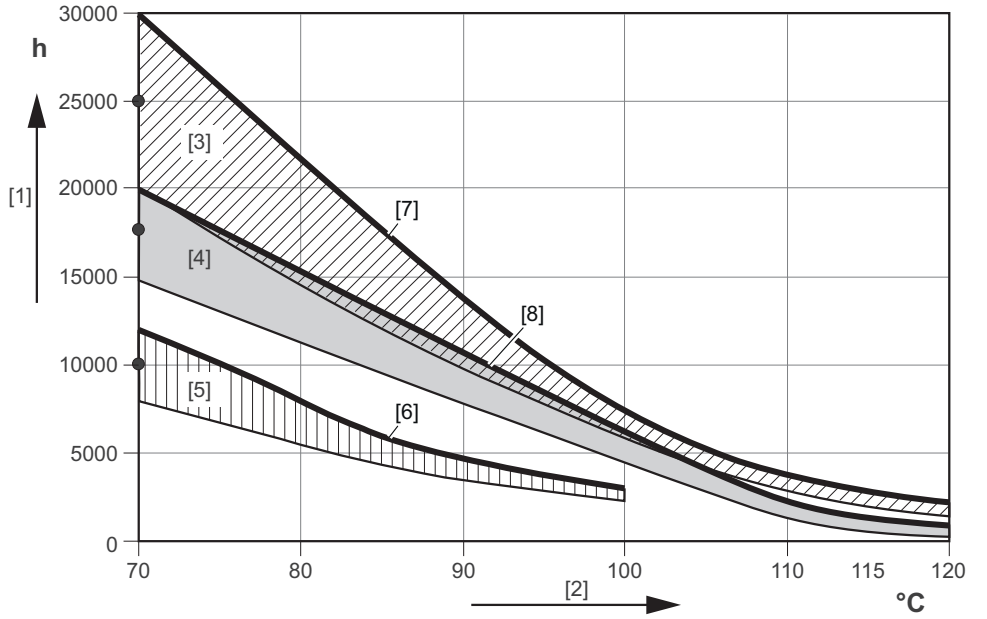
6.3 Lubricant change intervals

Use the following figure to determine the number of operating hours between 2 oil changes based on the sustained oil bath temperature at normal ambient conditions. In case of special designs under severe/aggressive ambient conditions, change the lubricant more frequently.



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[1] Operating hours
[2] Sustained oil bath temperature
[3] CLP PG/CLP PG NSF H1
[4] CLP HC/ CLP HC NSF H1
[5] CLP (CC)/E
[6] GearOil Base by SEW-EURODRIVE
[7] GearOil Poly (H1)- / GearFluid Poly (H1) by SEW-EURODRIVE
[8] GearOil Synth (H1) by SEW-EURODRIVE

- Average value per oil type at 70 °C

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6.4 Maintaining adapter AL../AMS../AQS../EWH..

The following table lists the obligatory intervals and the corresponding measures:

Time interval	What to do?
• Every 3000 operating hours; at least every 6 months	• Check the running noises to detect possible bearing damage. • Visually check the adapter for leakage. • With the drain hole design, check whether the condensation drain holes are clear.
• After 10 000 operating hours	• Check the rotational clearance. • Visually check the coupling ring (AMS.., EWH.., or AQS.., AL..).
• After 10 000 operating hours with NBR/FKM oil seals • After 20 000 operating hours with Premium Sine Seal adapter oil seals:	• Change the oil seal. With standard NBR or FKM oil seals, the new oil seal must not be fitted on the previous track. This is allowed with Premium Sine Seal adapter oil seals.

6.5 AD.. input shaft assembly maintenance

The following table lists the obligatory intervals and the corresponding measures:

Time interval	What to do?
• Every 3000 operating hours, at least every 6 months	• Check the running noises to detect possible bearing damage. • Visually check the adapter for leakage.
• After 10 000 operating hours	• Change the oil seal. Do not mount it in the same track.

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6.6 Inspection/maintenance of the gear unit

6.6.1 Checking the oil level and changing the oil

The procedure when checking the oil level and changing the oil depends on gear unit type, size and mounting position. Determine the code letter (A, B, C, D or E) in the following table in regard of gear unit type and size. Use the code letter to find the reference for the procedure for the corresponding gear unit in the 2nd table.

Gear unit type	Size	Code letter for chapter "Checking the oil level and changing the oil"					
		M1	M2	M3	M4	M5	M6
R	R..07 to 27	B					
	R..37/R..67	A					
	R..47/R..57	A				B	A
	R..77 to 167	A					
	RX..57 to 107	A					
F	F..27	B					
	F..37 to 157	A					
K	K..19/K..29	C					
	K..39/K..49	A					
	K..37 to 187	A					
S	S..37	C					
	S..47 to 97	A					
W	W..10 to 30	B					
	W..19 to 59	B					
	W..37 to 47	D			E	D	

Code letter	Chapter "Checking the oil level and changing the oil"	Reference
A:	• Helical gear units • Parallel-shaft helical gear units • Helical-bevel gear units K..39/K..49, K..37 to 187 • Helical-worm gear units S..47 to 97 **With oil level plug**	(→ 🗎 130)
B:	• Helical gear units • Parallel-shaft helical gear units • SPIROPLAN® W..0/W..9 **Without oil level plug, with cover plate**	(→ 🗎 133)
C:	• S..37 helical-worm gear unit • K..19/K..29 helical-bevel gear unit **Without oil level plug, without cover plate**	(→ 🗎 137)

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Code letter	Chapter "Checking the oil level and changing the oil"	Reference
D:	• SPIROPLAN® W..37/W..47 **In mounting positions M1, M2, M3, M5, M6 with oil level plug**	(→ 🗎 140)
E:	• SPIROPLAN® W..37/W..47... **In mounting position M4 without oil level plug and cover plate**	(→ 🗎 142)

Refer to chapter "Mounting positions" (→ 🗎 145) for notes on the mounting positions.

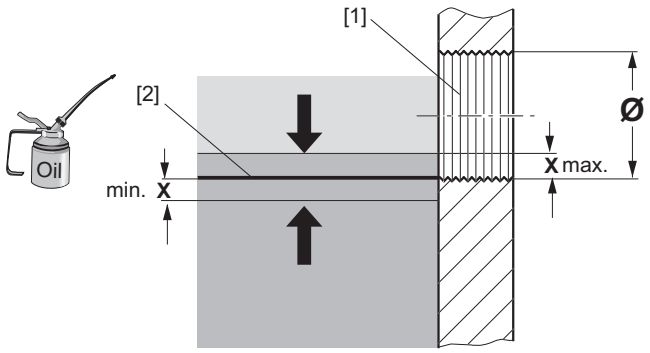
You cannot check the oil level of gear units in pivoted mounting position. The gear units are delivered with the correct oil level. Observe the specifications and fill quantities on the nameplate if you have to change the oil.

6.6.2 A: Helical, parallel-shaft helical, helical-bevel and helical-worm gear units with oil level plug

Checking the oil level at the oil level plug

Proceed as follows to check the oil level of the gear unit:

1. Observe the information at the beginning of chapter "Inspection/maintenance" (→ 🗎 123).
2. Determine the positions of the oil level plug and the breather valve using the mounting position sheets. See chapter "Mounting positions" (→ 🗎 145).
3. Place a container underneath the oil level plug.
4. Slowly unscrew the oil level plug. Small amounts of oil may leak out as the permitted maximum oil level is higher than the lower edge of the oil level bore.
5. Check the oil level according to the following figure and the corresponding table.



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[1] Oil level bore
[2] Oil level setpoint
X Min./max. oil level

Ø oil level bore	Approved fluctuation "x" of the oil level mm
M10 × 1	1.5
M12 × 1.5	2
M22 × 1.5	3
M33 × 2	4
M42 × 2	5

6. Proceed as follows if the oil level is too low:

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- Remove the breather valve from the breather bore.
- Fill in fresh oil of the same type (contact SEW-EURODRIVE if necessary) via the breather bore, up to the lower edge of the oil level bore.
- Screw in the breather valve again. When doing this, observe the tightening torques in chapter "Tightening torques for oil level plugs, oil drain plugs, screw plugs, breather valves and oil sight glasses" (→ 🗎 36).

7. Screw in the oil level plug again. When doing this, observe the tightening torques in chapter "Tightening torques for oil level plugs, oil drain plugs, screw plugs, breather valves and oil sight glasses" (→ 🗎 36).

Checking the oil via the oil drain plug

Proceed as follows to check the gear unit oil:

1. Observe the information at the beginning of chapter "Inspection/maintenance" (→ 🗎 123).
2. Determine the position of the oil drain plug using the mounting position sheets. See chapter "Mounting positions" (→ 🗎 145).
3. Remove a little oil from the oil drain plug.
4. Check the oil consistency:
   - Viscosity (have this carried out by a suitable laboratory if necessary)
   - If you can see that the oil is heavily contaminated, it is advisable to change the oil, even if this is outside the service intervals specified in "Inspection and maintenance intervals" (→ 🗎 126).
5. Check the oil level. See previous chapter.

Changing the oil via the oil drain plug and the breather valve

⚠ WARNING

Risk of burns due to hot gear unit and hot gear unit oil.

Severe injuries.

- Let the gear unit cool down before you start working on it. Due to the better flowability, the gear unit oil should still be warm so that the gear unit can be drained best.

1. Observe the information at the beginning of chapter "Inspection/maintenance" (→ 🗎 123).
2. Determine the position of the oil drain plug, the oil level plug and the breather valve using the mounting position sheets. See chapter "Mounting positions" (→ 🗎 145).
3. Place a container underneath the oil drain plug.
4. Remove the oil level plug, the breather valve and the oil drain plug.
5. Drain all the oil.
6. Re-insert the oil drain plug. When doing this, observe the tightening torques in chapter "Tightening torques for oil level plugs, oil drain plugs, screw plugs, breather valves and oil sight glasses" (→ 🗎 36).
7. Fill in fresh oil of the same type (contact SEW-EURODRIVE if necessary) via the breather bore. Do not mix different synthetic lubricants.

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- Observe the oil quantities according to the specifications on the nameplate or according to the mounting position. See chapter "Lubricant fill quantities" (→ 🗎 205).
- Check the oil level at the oil level plug.

8. Re-insert the oil level plug and the breather valve. When doing this, observe the tightening torques in chapter "Tightening torques for oil level plugs, oil drain plugs, screw plugs, breather valves and oil sight glasses" (→ 🗎 36).

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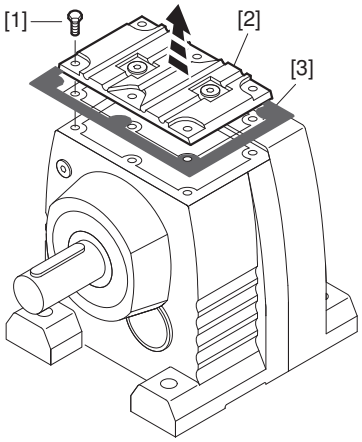
6.6.3 B: Helical, parallel shaft helical, SPIROPLAN® gear units without oil level plug with cover plate

Checking the oil level via the cover plate

For gear units without an oil level bore, check the oil level via the cover plate opening. Proceed as follows:

1. Observe the information at the beginning of chapter "Inspection/maintenance" (→ 🗎 123).
2. To position the cover plate on the top, place the gear unit in the following mounting position:
   - R..07 to R..57 in mounting position M1
   - F..27 in mounting position M3
   - W..10 to W..30 and W..19 to W..59 in mounting position M1
3. Loosen the screws [1] of the cover plate [2]. Remove the cover plate [2] with its gasket [3] (see figure below).



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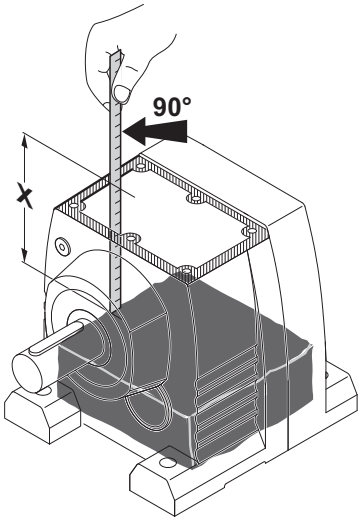
4. Determine the vertical distance "x" between oil level and sealing surface of the gear unit housing (see following figure).



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5. Compare the determined value "x" to the max. distance between oil level and sealing surface of the gear unit housing specified in the following table. Adjust the fill level if required.

Gear unit type		Maximum distance x between oil level and sealing surface of gear unit housing for mounting position					
		M1	M2	M3	M4	M5	M6
R..07	2-stage	52 ± 1	27 ± 1	27 ± 1	27 ± 1	27 ± 1	27 ± 1
	3-stage	49 ± 1	21 ± 1	21 ± 1	21 ± 1	21 ± 1	21 ± 1
R..17	2-stage	63 ± 1	18 ± 1	46 ± 1	18 ± 1	46 ± 1	46 ± 1
	3-stage	58 ± 1	11 ± 2	40 ± 2	11 ± 2	40 ± 2	40 ± 2
R..27	2-stage	74 ± 1	22 ± 1	45 ± 1	22 ± 1	45 ± 1	45 ± 1
	3-stage	76 ± 1	19 ± 1	42 ± 1	19 ± 1	42 ± 1	42 ± 1
R..47	2-stage	–	–	–	–	39 ± 1	–
	3-stage	–	–	–	–	32 ± 1	–
R..57	2-stage	–	–	–	–	32 ± 1	–
	3-stage	–	–	–	–	28 ± 1	–
F..27	2-stage	78 ± 1	31 ± 1	72 ± 1	56 ± 1	78 ± 1	78 ± 1
	3-stage	71 ± 1	24 ± 1	70 ± 1	45 ± 1	71 ± 1	71 ± 1
W..19		42 ± 1			6 ± 1	14 ± 1	
W..29		45 ± 1			5 ± 1	15 ± 1	
W..39		56 ± 1			4 ± 1	25 ± 1	
W..49		65 ± 1			9 ± 1	24 ± 1	
W..59		63 ± 1			4 ± 1	9 ± 1	
Irrespective of mounting position							
W..10		12 ± 1					
W..20		19 ± 1					
W..30		31 ± 1					

6. Close the gear unit after the oil level check:
   - Re-attach the seal of the cover plate. Make sure that the sealing surfaces are clean and dry.
   - Screw on the cover plate. Tighten the cover plate screw connections working from the inside to the outside. Tighten the cover plate screw connections in the sequence depicted in the following figure. Tighten the cover plate screw connections with the specified tightening torque according to the following table.

Repeat the tightening procedure until the screws are properly tightened. To avoid damaging the cover plate, use only impulse wrenches or torque wrenches. Do not use impact screwdrivers.

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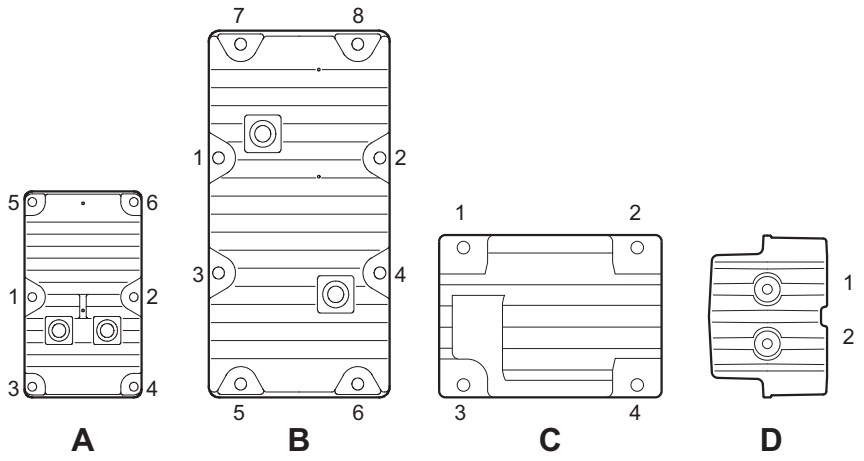

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Gear unit type	Image	Retaining thread	Tightening torque T_N Nm	Minimum tightening torque T_{min} Nm
R/RF07/17/27	D	M6	11	7
R/RF47/57	A	M6	11	7
F..27	B	M5	6	4
W..10	C	M5	6	4
W..19	C	M5	6	4
W..20	C	M6	11	7
W..29	A	M5	6	4
W..30	A	M6	11	7
W..39	A	M5	6	4
W..49	A	M5	6	4
W..59	A	M5	6	4

Checking the oil via cover plate

Proceed as follows to check the gear unit oil:

1. Observe the information at the beginning of chapter "Inspection/maintenance" (→ 🗎 123).
2. Open the cover plate of the gear unit according to chapter "Checking the oil level via the cover plate" (→ 🗎 133).
3. Take an oil sample via the cover plate opening.
4. Check the oil consistency.
   - Viscosity (have this carried out by a suitable laboratory if necessary)
   - If you can see that the oil is heavily contaminated, SEW-EURODRIVE recommends to change the oil, even if this is outside the service intervals specified in "Inspection and maintenance intervals" (→ 🗎 129).
5. Check the oil level. See chapter "Checking the oil level via the cover plate" (→ 🗎 133).

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6. Screw on the cover plate. Observe the order and the tightening torques in accordance with chapter "Checking the oil level via the cover plate" (→ 🗎 133).

Changing the oil via the cover plate

⚠ WARNING

Risk of burns due to hot gear unit and hot gear unit oil.

Severe injuries.

- Let the gear unit cool down before you start working on it. Due to the better flowability, the gear unit oil should still be warm so that the gear unit can be drained best.

1. Observe the information at the beginning of chapter "Inspection/maintenance" (→ 🗎 123).
2. Open the cover plate of the gear unit according to chapter "Checking the oil level via the cover plate" (→ 🗎 133).
3. Completely drain the oil into a container via the cover plate opening.
4. Fill in fresh oil of the same type (contact SEW-EURODRIVE if necessary) via the cover plate. You must not mix different synthetic lubricants.
   - Fill in the oil quantity as specified on the nameplate or the order confirmation.
5. Check the oil level.
6. Screw on the cover plate. Observe the order and the tightening torques in accordance with chapter "Checking the oil level via the cover plate" (→ 🗎 133).

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6.6.4 C: Helical-worm gear units S..37 and helical-bevel gear units K..19/K..29 without oil level plug and cover plate

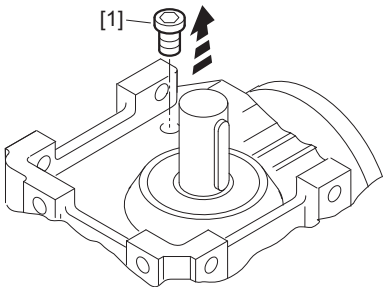
Checking the oil level via screw plug

The gear units S..37, K..19, and K..29 are not equipped with an oil level plug or a cover plate. This is why the oil level is checked via the control bore.

1. Observe the information at the beginning of chapter "Inspection/maintenance" (→ 🗎 123).
2. Place the gear unit in the mounting position stated in the following table. This is why the control bore always points upwards.

Gear unit	Mounting position
S..37	M5/M6
K..19/K..29	M6

3. Remove the screw plug [1] as shown in the following figure.



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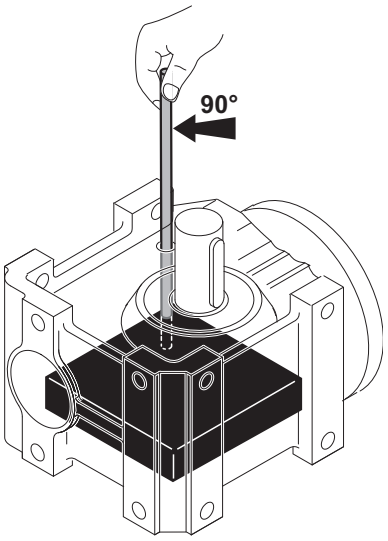
4. Insert the dipstick vertically via the control bore all the way to the bottom of the gear unit housing. Pull the dipstick vertically out of the control bore again, as shown in the following figure.



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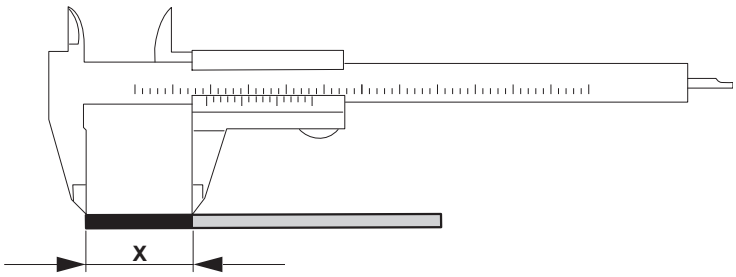
5. Determine the size of the section "x" of the dipstick covered with lubricant using a slide-gauge as depicted in the following figure.



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6. Compare the determined value "x" to the min. value depending on the mounting position specified in the following table. Correct the fill level if required.

Gear unit type	Oil level = wetted section "x" in mm of the dipstick Mounting position					
	M1	M2	M3	M4	M5	M6
K..19	33 ± 1	33 ± 1	33 ± 1	35 ± 1	33 ± 1	33 ± 1
K..29	50 ± 1	50 ± 1	50 ± 1	63 ± 1	50 ± 1	50 ± 1
S..37	10 ± 1	24 ± 1	34 ± 1	37 ± 1	24 ± 1	24 ± 1

7. Re-insert and tighten the screw plug. When doing this, observe the tightening torques in chapter "Tightening torques for oil level plugs, oil drain plugs, screw plugs, breather valves and oil sight glasses" (→ 🗎 36).

Checking the oil via the screw plug

1. Observe the information at the beginning of chapter "Inspection/maintenance" (→ 🗎 123).
2. Open the screw plug of the gear unit according to chapter "Checking the oil level via screw plug" (→ 🗎 137).
3. Take an oil sample via the screw plug bore.
4. Check the oil consistency.
   - Viscosity (have this carried out by a suitable laboratory if necessary)
   - If you can see that the oil is heavily contaminated, SEW-EURODRIVE recommends to change the oil, even if this is outside the service intervals specified in "Inspection and maintenance intervals" (→ 🗎 126).
5. Check the oil level. See chapter "Checking the oil level via screw plug" (→ 🗎 137).
6. Screw the screw plug back into place. When doing this, observe the tightening torques in chapter "Tightening torques for oil level plugs, oil drain plugs, screw plugs, breather valves and oil sight glasses" (→ 🗎 36).

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Changing the oil via the screw plug

⚠ WARNING

Risk of burns due to hot gear unit and hot gear unit oil.

Severe injuries.

- Let the gear unit cool down before you start working on it. Due to the better flowability, the gear unit oil should still be warm so that the gear unit can be drained best.

1. Observe the information at the beginning of chapter "Inspection/maintenance" (→ 🗎 123).
2. Open the screw plug of the gear unit according to chapter "Checking the oil level via screw plug" (→ 🗎 137).
3. Completely drain the oil via the screw plug bore.
4. Fill in fresh oil of the same type (contact SEW-EURODRIVE if necessary) via the control bore. You must not mix different synthetic lubricants.
   - Observe the oil quantity specified on the nameplate or according to the mounting position. Observe chapter "Lubricant fill quantities" (→ 🗎 205).
5. Check the oil level.
6. Screw the screw plug back into place. When doing this, observe the tightening torques in chapter "Tightening torques for oil level plugs, oil drain plugs, screw plugs, breather valves and oil sight glasses" (→ 🗎 36).

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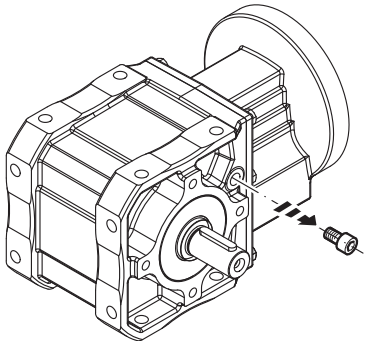
6.6.5 D: SPIROPLAN® W..37/W..47 in mounting position M1, M2, M3, M5, M6 with oil level plug

Checking the oil level at the oil level plug

Proceed as follows to check the oil level of the gear unit:

1. Observe the information at the beginning of chapter "Inspection/maintenance" (→ 🗎 123).
2. Set up the gear unit in M1 mounting position.
3. Slowly remove the oil level plug (see following figure). Small amounts of oil may leak out.



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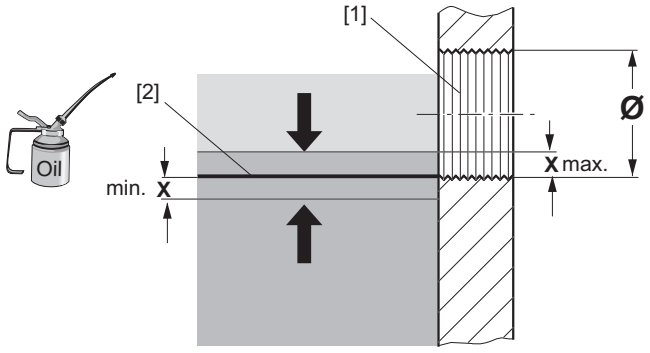
4. Check the oil level according to the following figure.



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[1] Oil level bore [2] Target oil level

Ø oil level bore	Fluctuation "x" for minimum and maximum fill level in mm
M10 × 1	1.5

5. If the oil level is too low, add fresh oil of the same type (consult SEW-EURODRIVE if necessary) via the oil level bore, up to the lower edge of the bore.
6. Screw in the oil level plug again. When doing this, observe the tightening torques in chapter "Tightening torques for oil level plugs, oil drain plugs, screw plugs, breather valves and oil sight glasses" (→ 🗎 36).

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Checking the oil level at the oil level plug

Proceed as follows to check the oil of the gear unit:

1. Observe the information at the beginning of chapter "Inspection/maintenance" (→ 🗎 123).
2. Remove some oil at the oil level plug.
3. Check the oil consistency.
   - Viscosity (have this carried out by a suitable laboratory if necessary)
   - If you can see that the oil is heavily contaminated, SEW-EURODRIVE recommends to change the oil, even if this is outside the service intervals specified in "Inspection and maintenance intervals" (→ 🗎 126).
4. Check the oil level. See previous chapter.

Changing the oil at the oil level plug

⚠ WARNING

Risk of burns due to hot gear unit and hot gear unit oil.

Severe injuries.

- Let the gear unit cool down before you start working on it. Due to the better flowability, the gear unit oil should still be warm so that the gear unit can be drained best.

1. Observe the information at the beginning of chapter "Inspection/maintenance" (→ 🗎 123).
2. Set up the gear unit in M5 or M6 mounting position. See chapter "Mounting positions" (→ 🗎 145).
3. Place a container underneath the oil level plug.
4. Remove the oil level plugs on the A- and B-side of the gear unit.
5. Drain all the oil.
6. Re-insert the lower oil level plug. When doing this, observe the tightening torques in chapter "Tightening torques for oil level plugs, oil drain plugs, screw plugs, breather valves and oil sight glasses" (→ 🗎 36).
7. Fill in new oil of the same type (contact SEW-EURODRIVE if necessary) via the upper oil level plug. You must not mix different synthetic lubricants.
   - Observe the oil quantity specified on the nameplate or according to the mounting position. See chapter "Lubricant fill quantities" (→ 🗎 205).
   - Check the oil level in accordance with in chapter "Checking the oil level at the oil level plug" (→ 🗎 140).
8. Re-insert the upper oil level plug. When doing this, observe the tightening torques in chapter "Tightening torques for oil level plugs, oil drain plugs, screw plugs, breather valves and oil sight glasses" (→ 🗎 36).

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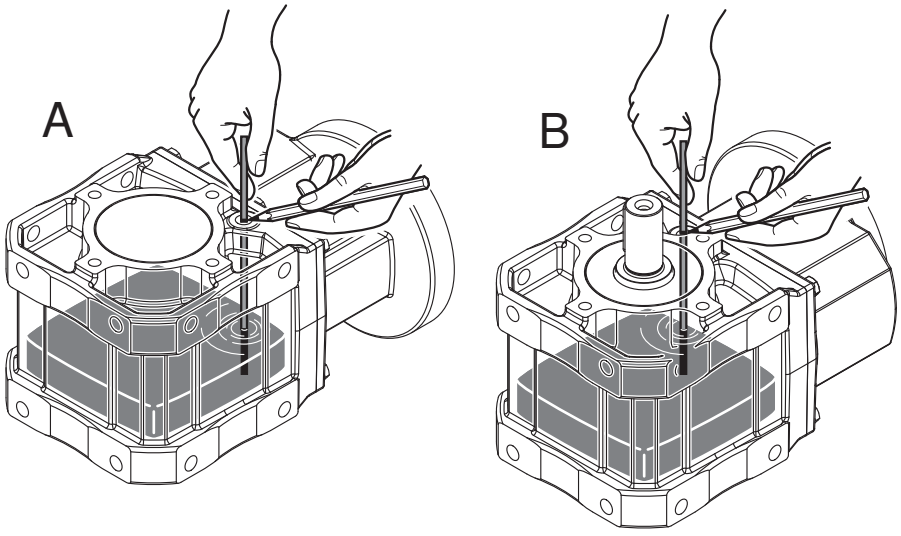
6.6.6 E: SPIROPLAN® W..37 / W..47 in mounting position M4 without oil level plug and cover plate

Checking the oil level via screw plug

The W..37/W..47 gear units are not equipped with an oil level plug or a cover plate. This is why the oil level is checked via the control bore.

1. Observe the information at the beginning of chapter "Inspection/maintenance" (→ 🗎 123).
2. Set up the gear unit in M5 or M6 mounting position. See chapter "Mounting positions" (→ 🗎 145).
3. Remove the screw plug.
4. Insert the dipstick vertically via the control bore all the way to the bottom of the gear unit housing. Mark the point on the dipstick where it exits the gear unit. Pull out the dipstick vertically (see following figure).



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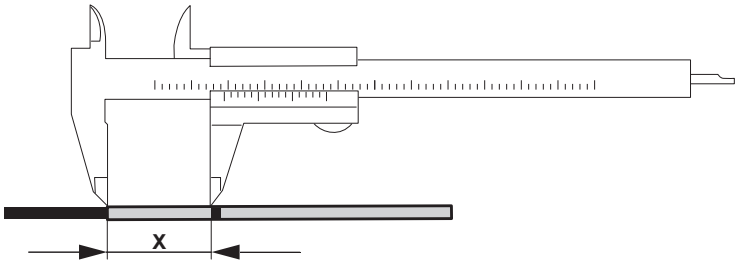
5. Determine the section "x" between the wetted part and the marking using a caliper (see following figure).



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6. Compare the determined value "x" to the minimum value depending on the mounting position specified in the following table. Correct the fill level if required.

Gear unit type	Oil level = section "x" in mm of the dipstick Mounting position during check	
	M5 Lying on the A-side	M6 Lying on the B-side
W..37 in mounting position M4	37 ± 1	29 ± 1

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Gear unit type	Oil level = section "x" in mm of the dipstick Mounting position during check	
	M5 Lying on the A-side	M6 Lying on the B-side
W..47 in mounting position M4	41 ± 1	30 ± 1

7. Re-insert and tighten the screw plug. When doing this, please observe the tightening torques in chapter "Tightening torques for oil level plugs, oil drain plugs, screw plugs, breather valves and oil sight glasses" (→ 🗎 36).

Checking the oil via the screw plug

Proceed as follows to check the oil of the gear unit:

1. Observe the information at the beginning of chapter "Inspection/maintenance" (→ 🗎 123).
2. Remove a little oil at the oil screw plug.
3. Check the oil consistency:
   - Viscosity (have this carried out by a suitable laboratory if necessary)
   - If you can see that the oil is heavily contaminated, SEW-EURODRIVE recommends to change the oil, even if this is outside the service intervals specified in "Inspection and maintenance intervals" (→ 🗎 126).
4. Check the oil level. See previous chapter.

Changing the oil via the screw plug

⚠ WARNING

Risk of burns due to hot gear unit and hot gear unit oil.

Severe injury.

- Let the gear unit cool down before you start working on it. Due to the better flowability, the gear unit oil should still be warm so that the gear unit can be drained best.

1. Observe the information at the beginning of chapter "Inspection/maintenance" (→ 🗎 123).
2. Set up the gear unit in M5 or M6 mounting position. See chapter "Mounting positions" (→ 🗎 145).
3. Place a container underneath the screw plug.
4. Remove the screw plugs at the A and B-side of the gear unit.
5. Drain all the oil.
6. Re-insert the lower screw plug. When doing this, please observe the tightening torques in chapter "Tightening torques for oil level plugs, oil drain plugs, screw plugs, breather valves and oil sight glasses" (→ 🗎 36).
7. Add fresh oil of the same type (consult SEW-EURODRIVE if necessary) via the upper screw plug. You must not mix different synthetic lubricants.
   - Add the oil quantity specified on the nameplate or in accordance with the information in chapter "Lubricant fill quantities" (→ 🗎 205).

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- Check the oil level in accordance with in chapter "Checking the oil level via screw plug" (→ 🗎 142).

8. Re-insert the upper screw plug. When doing this, please observe the tightening torques in chapter "Tightening torques for oil level plugs, oil drain plugs, screw plugs, breather valves and oil sight glasses" (→ 🗎 36).

6.6.7 Replacing the oil seal

NOTICE

Damage to oil seal when mounted below 0 °C.

Damage to oil seal.

- Store oil seals at ambient temperatures over 0 °C.
- If necessary, heat the oil seal before mounting it.

Proceed as follows:

1. Ensure that there is a sufficient grease reservoir between the dust lip and sealing lip, depending on the gear unit design.
2. If you use double oil seals, the space has to be filled with grease for one third.

6.6.8 Painting the gear unit

NOTICE

Paint can block the breather valve and damage the sealing lips of the oil seals.

Damage to property.

- Thoroughly cover the breather valve and sealing lip of the oil seals with strips prior to painting/re-painting.
- Remove the strips after painting.

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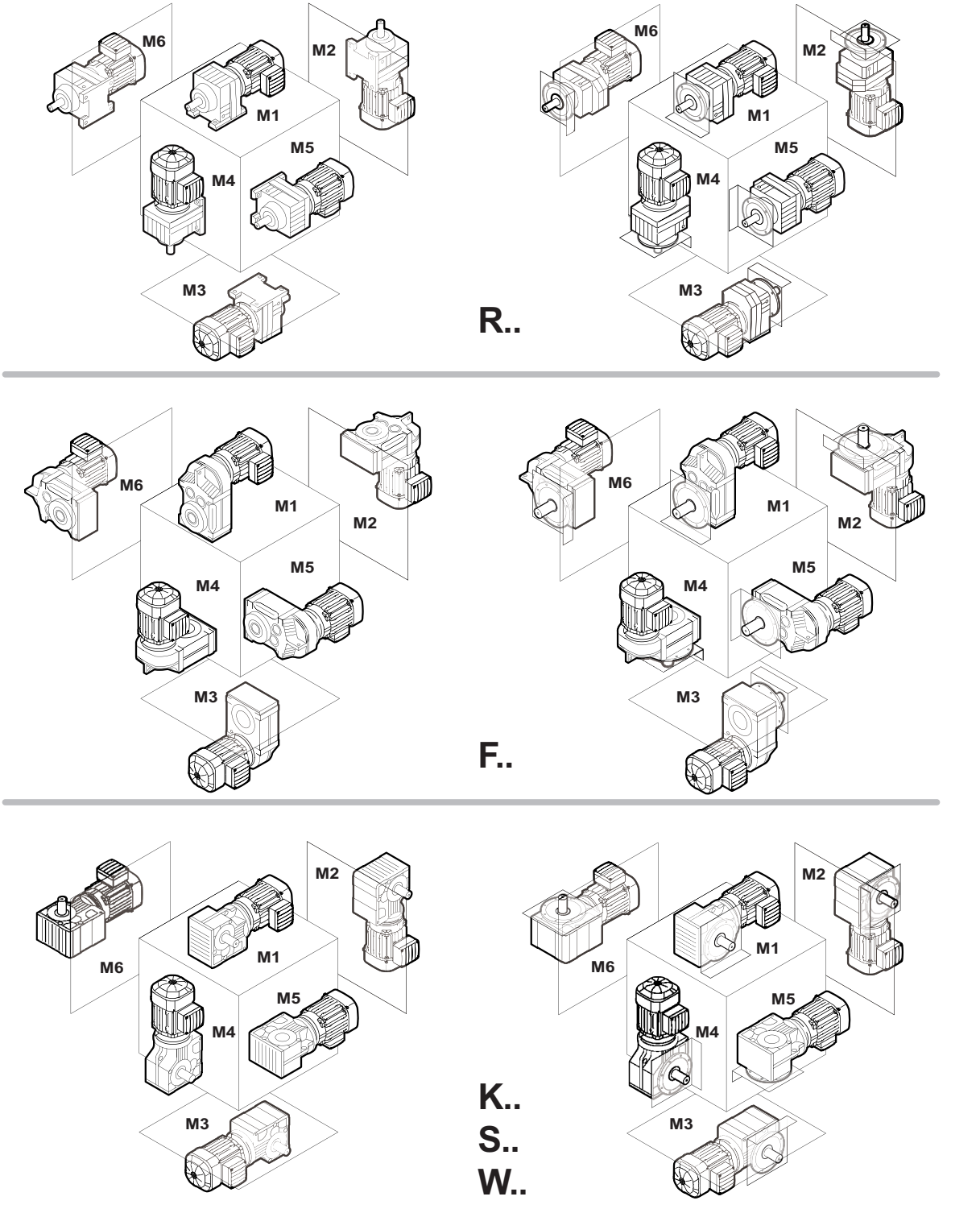
7 Mounting positions

7.1 Designation of the mounting positions

The following illustration shows the SEW-EURODRIVE mounting positions M1 – M6:



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7.2 Churning losses and thermal rating

* (→ 🗎 X)

Churning losses may occur with the following conditions. They must be considered during the thermal check:

- A mounting position where the first gear unit stage is fully immersed in the lubricant. The respective mounting positions of the gear units are marked with * in chapter "Mounting position sheets" (→ 🗎 149).
- A high mean input speed and consequently a high circumferential speed of the gear wheels of the input gear stage.

If one or both of these conditions apply, determine the requirements from the application and the corresponding operating conditions (see chapter "Data for calculating the thermal rating" (→ 🗎 146)) and consult SEW-EURODRIVE. SEW-EURODRIVE can calculate the thermal rating based on the actual operating conditions. The thermal rating of the gear unit can be increased by appropriate measures, such as by using a synthetic lubricant with higher thermal endurance properties.

INFORMATION

To reduce churning losses to a minimum, use gear units, preferably in the M1 mounting position.

7.2.1 Data for calculating the thermal rating

The following information is required for calculating the thermal rating:

Gear unit type and design:

- Gear unit ratio i
- Mean input speed n_{em} or mean output speed n_{am} each in min^{-1}
- Effective motor torque M_{eff} in Nm
- Input motor power P_{Mot} in kW
- Mounting position M1 – M6 or pivoting angle

Installation site:

- Ambient temperature T_{amb} in °C
- Installation altitude
- In small, closed rooms or in large rooms (halls) or outdoors

Installation situation:

- Space-critical or well ventilated
- Steel base or concrete base

7.3 Change of mounting position

Observe the following information when operating the gearmotor in a mounting position other than the one indicated in the order:

- Adjust the lubricant fill quantity to the changed mounting position.
- Adjust the position of the breather valve.
- When changing the mounting position to M4: Contact SEW-EURODRIVE. Depending on the drive's operating mode, an oil expansion tank might be necessary (see chapter "Oil expansion tank" (→ 🗎 108)).

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- For helical-bevel gearmotors: Contact SEW-EURODRIVE if you want to change to mounting position M5 or M6.
- For helical-worm gearmotors: Contact SEW-EURODRIVE if you want to change to mounting position M2 or M3.
- For helical gearmotors: Contact SEW-EURODRIVE if you want to change to mounting position M2.
- If you change the mounting position to a mounting position that requires more oil, SEW-EURODRIVE recommends performing a thermal check/doing the project planning again.

7.4 Gear units in pivoted mounting position (dynamic)

The dynamic pivoted mounting position is available on request for gear units of the types R..7, F..7, K..7, K..9, S..7 and SPIROPLAN® W..9.

In the pivoted mounting position, the gear units are delivered with the maximum required oil fill quantity and sealed with oil screw plugs. The gear unit can be pivoted during operation to the mounting positions required by the customer.

7.5 Gear units in pivoted mounting position (stationary)

The stationary pivoted mounting position is available for all gear units of the type R..7, F..7, K..7, K..9, S..7 and SPIROPLAN® W..7.

In the stationary pivoted mounting position, the gear units are delivered with the oil fill quantity required for this pivoted mounting position and sealed with oil screw plugs. For gear units with stationary pivoted mounting position, replace the highest screw plug with the supplied breather valve before startup. When doing this, observe the tightening torques in chapter "Tightening torques for oil level plugs, oil drain plugs, screw plugs, breather valves and oil sight glasses" (→ 🗎 36).

7.6 Universal mounting position M0

SPIROPLAN® W..10 to W..30 gear units are available in the universal mounting position M0. Due to their small size they are completely enclosed and do not have a breather valve. You can use them in any mounting position from M1 to M6 without needing to make any adjustments to the gear unit.

All W..10 to W..30 gear units of a particular size have the same oil fill quantity.

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7.7 Mounting position MX

Mounting position MX is available for all gear units of sizes R..7, F..7, K..7, K..9, S..7 and SPIROPLAN® W..7 and W..9.

Before startup, make adjustments dependent on the mounting position for gear units in mounting position MX.

In the mounting position MX, the gear units are delivered with the maximum required oil fill quantity and sealed with oil screw plugs. A breather valve is included with each drive. The oil fill volume must be adapted according to the mounting position of the gear unit (see chapter "Lubricant fill quantities" (→ 🗎 205)). Customers will also have to mount the enclosed breather valve at the proper location depending on the mounting position, see chapter "Mounting position sheets" (→ 🗎 149). When screwing in the breather valve, observe the corresponding tightening torque in chapter "Tightening torques for oil level plugs, oil drain plugs, screw plugs, breather valves and oil sight glasses" (→ 🗎 36).

Check for the correct oil level before startup, as described in chapter "Checking the oil level and changing the oil" (→ 🗎 129).

7.7.1 Compound gear units in MX mounting position

In MX mounting position, both gear units (primary and subsequent gear unit) are in the same mounting position.

7.8 Variable mounting position

The variable mounting position is available upon request for gear units of the types R.., F.., K.., S.., and SPIROPLAN® W..7/W..9.

For gear units with variable mounting position, you must perform mounting position-dependent adjustments before startup. Adjustment of the oil fill quantity is not required.

With the variable mounting position, the gear units are delivered with the maximum required oil fill quantity of the mentioned mounting positions and sealed with oil screw plugs. A breather valve is included if necessary.

The enclosed breather valve must be mounted in the proper location depending on the mounting position, see chapter "Mounting position sheets" (→ 🗎 149).

When screwing in the breather valve, observe the corresponding tightening torque in chapter "Tightening torques for oil level plugs, oil drain plugs, screw plugs, breather valves and oil sight glasses" (→ 🗎 36).

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7.9 Mounting position sheets

7.9.1 Key to the mounting position sheets

INFORMATION

The positions of the breather valve, oil level plug, and oil drain plug specified in the mounting position sheets are binding and comply with the assembly specifications.

The motors are only depicted symbolically on the mounting position sheets.

INFORMATION

For gear units with solid shaft: The displayed shaft is always on the A-side.

For shaft-mounted gear units: The shaft with dashed lines represents the customer shaft. The output end (output shaft position) is always shown on the A-side.

INFORMATION

SPIROPLAN® gearmotors W..10, W..20, and W..30 are independent of the mounting position. However, mounting positions M1 to M6 are also shown for SPIROPLAN® gearmotors to assist you in working with this documentation.

INFORMATION

SPIROPLAN® gearmotors W..10 to W..30 cannot be equipped with breather valves, oil level plugs or oil drain plugs.

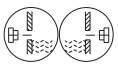
SPIROPLAN® W..7 and W..9 gearmotors are only equipped with a breather valve in mounting position M4.

INFORMATION

Some gear units can be supplied in mounting position M0. In this case, the gear unit is delivered in a universal mounting position and can be adjusted to various mounting positions by the customer. It may be necessary to contact SEW-EURODRIVE.

Symbols used

The following table shows the symbols used in the mounting position sheets.

Symbol	Meaning
	Breather valve
	Oil level plug
	Oil drain plug

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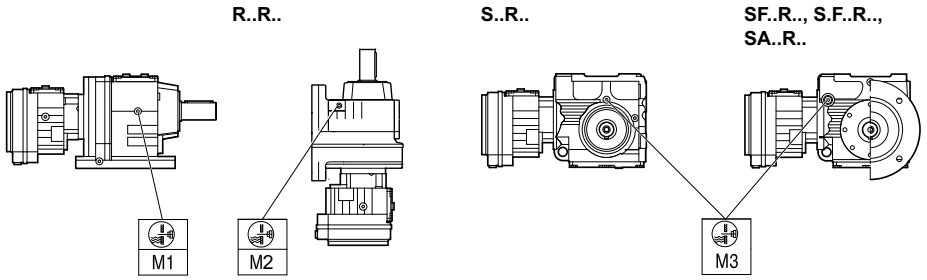
7.9.2 Position of the oil level plug of compound gear units

To ensure sufficient lubrication of the first gear unit (larger gear unit) in the case of compound gear units, the following gear units have a higher oil level in the specified mounting positions:

- Helical gear unit type R..R in mounting position M1 and M2
- Helical-worm gear unit type S..R in mounting position M3

The oil level plugs are located at the following positions, deviating from the specifications on the mounting position sheets:



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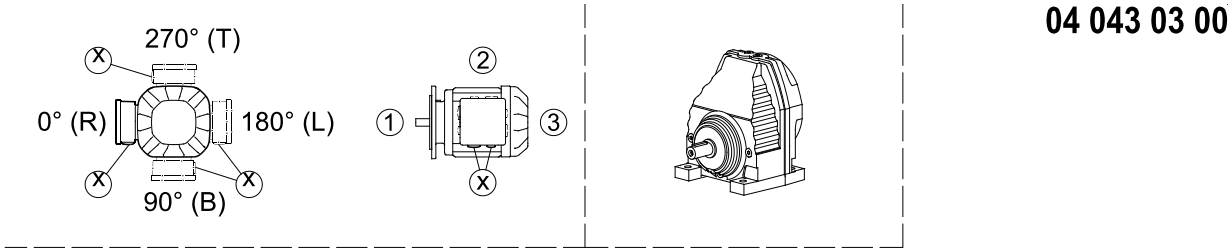
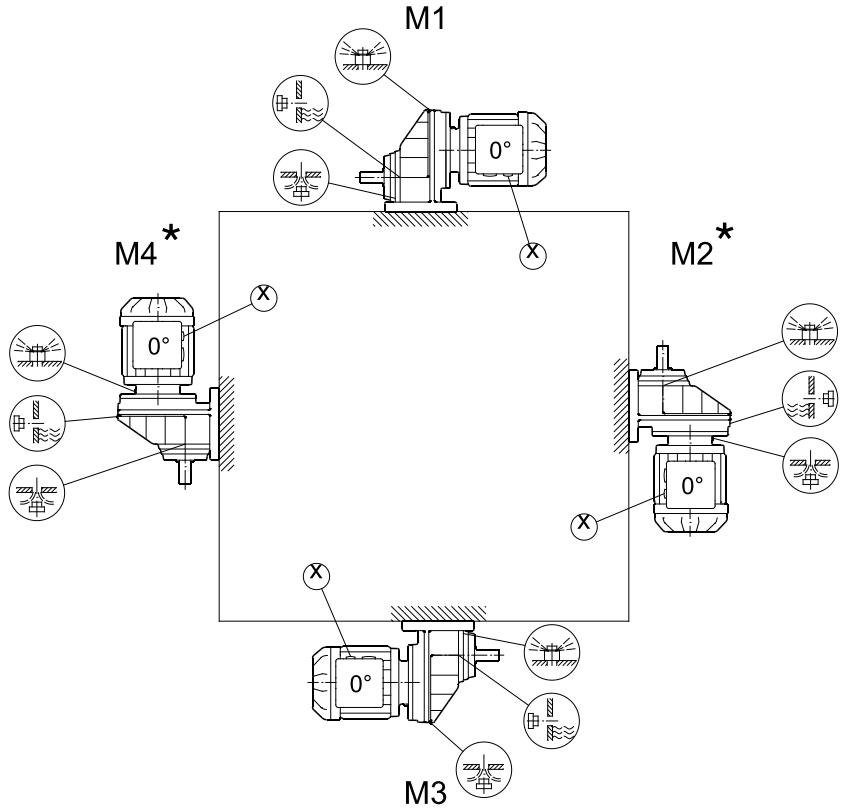
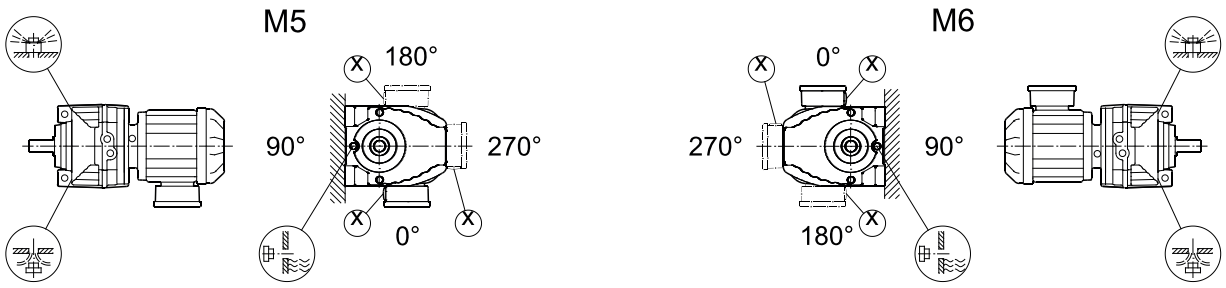
Symbol	Meaning
	Oil level plug

7.9.3 Mounting positions of helical gear units

RX57 – RX107







* (→ 🗎 146)

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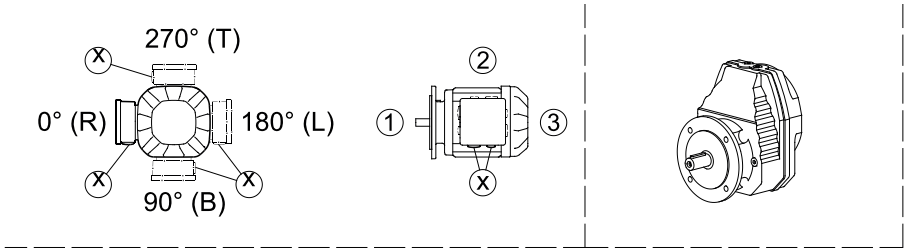
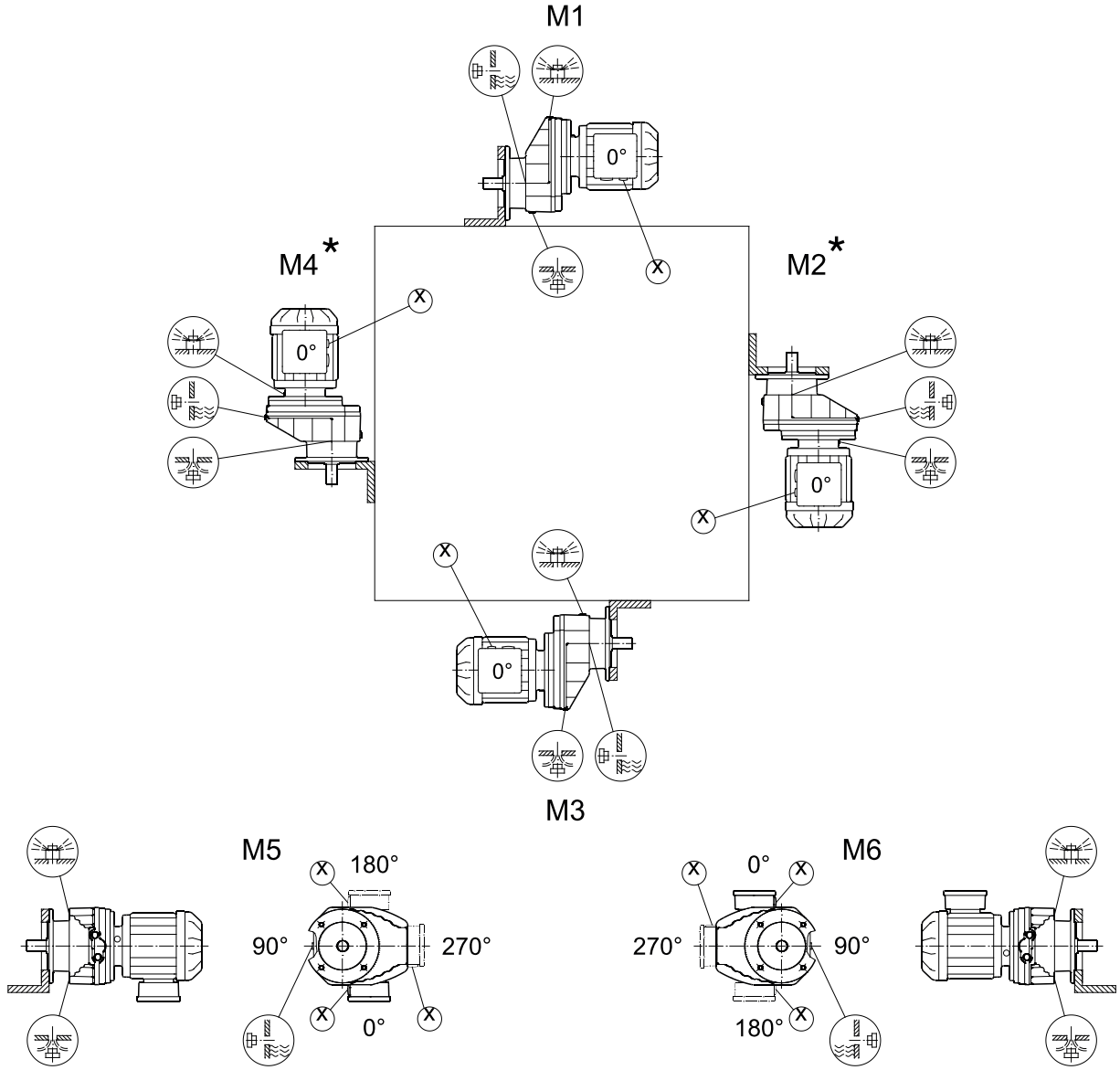
RXF57 – RXF107

04 044 03 00

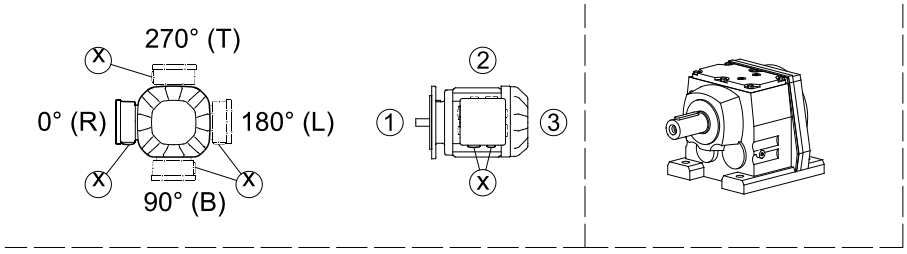


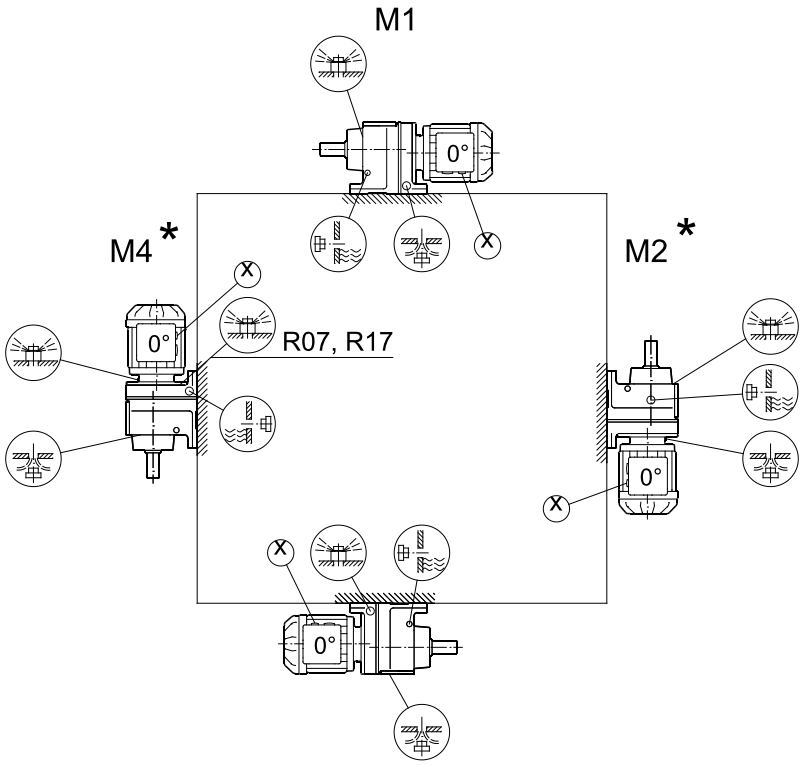


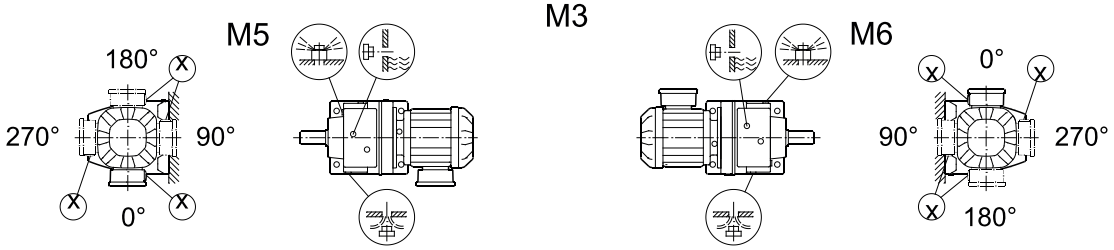
* (→ 146)

R07 – R167

04 040 04 00







R07	M1, M2, M3, M5, M6
R17, R27	M1, M3, M5, M6
R07, R17, R27	
R47, R57	M5

* (→ 🗎 146)

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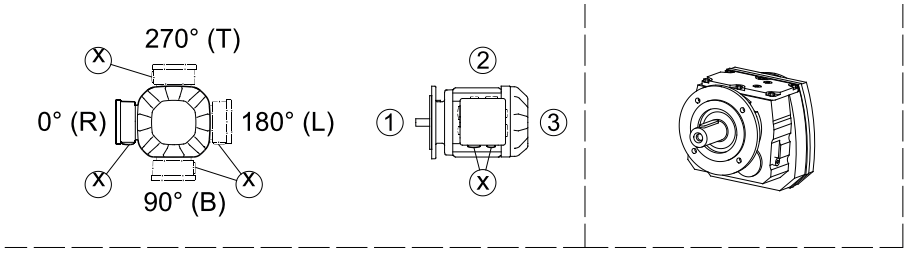
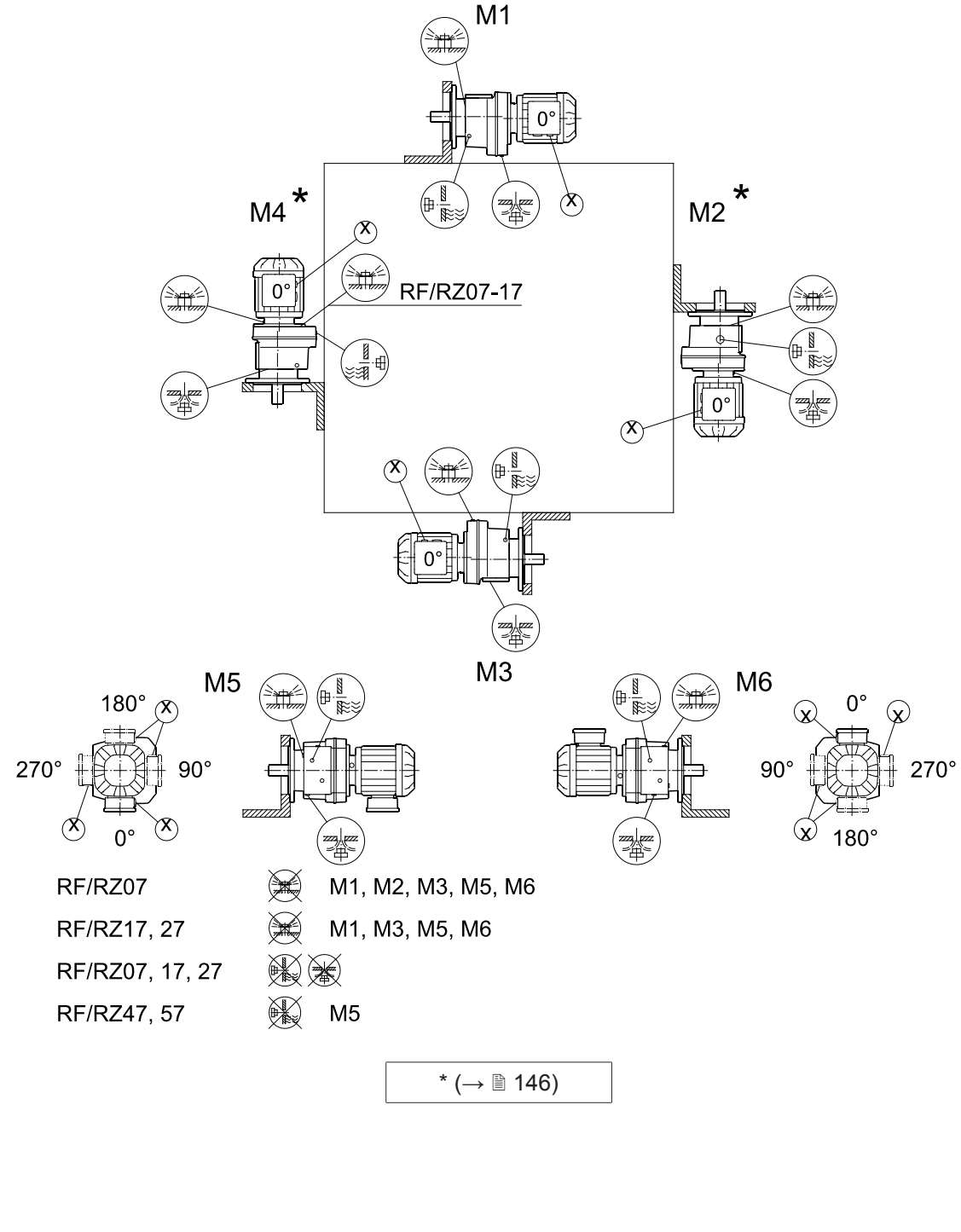
RF07 – RF167, RZ07 – RZ87, RM57 – RM167

04 041 04 00





RF/RZ07	⊗	M1, M2, M3, M5, M6
RF/RZ17, 27	⊗	M1, M3, M5, M6
RF/RZ07, 17, 27	⊗ ⊗	
RF/RZ47, 57	⊗	M5

* (→ 🗎 146)

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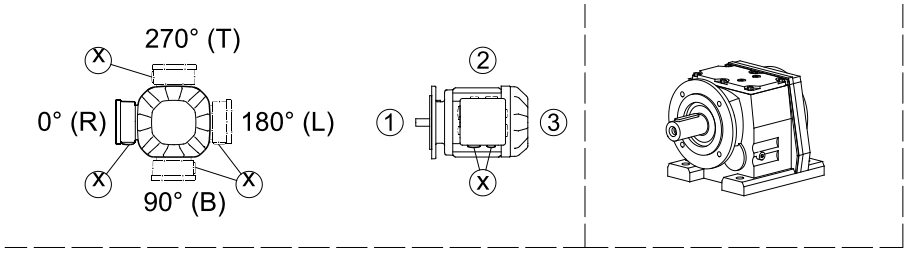
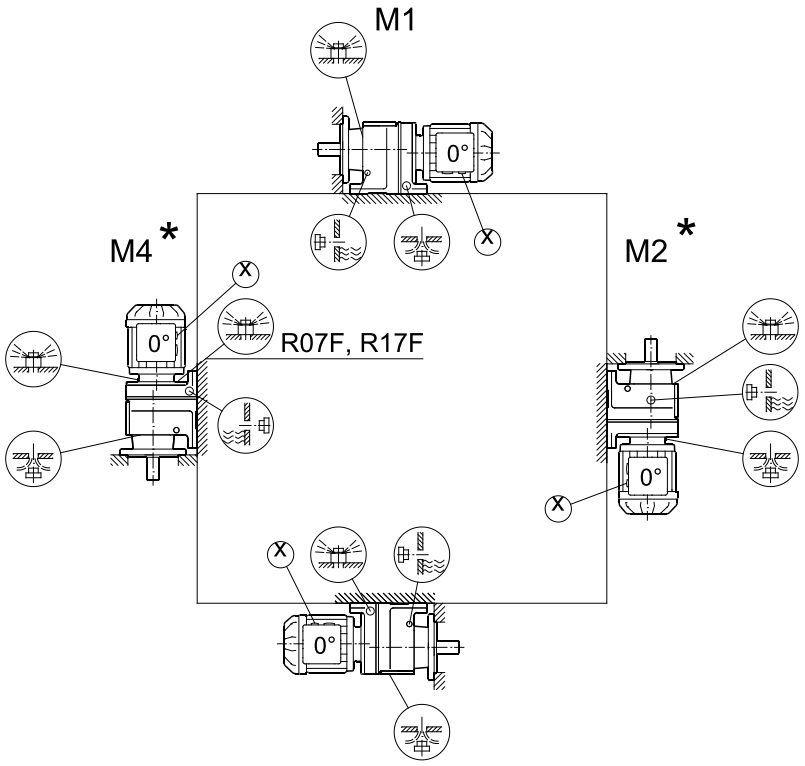
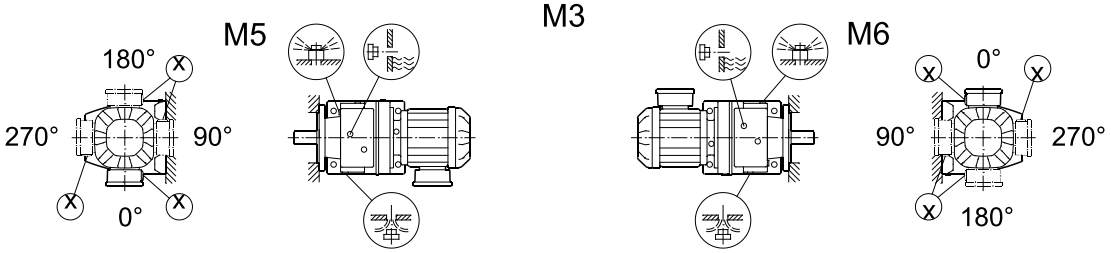
R07F – R87F

04 042 04 00







R07F	M1, M2, M3, M5, M6
R17F, R27F	M1, M3, M5, M6
R07F, R17F, R27F	
R47F, R57F	M5

* (→ 🗎 146)

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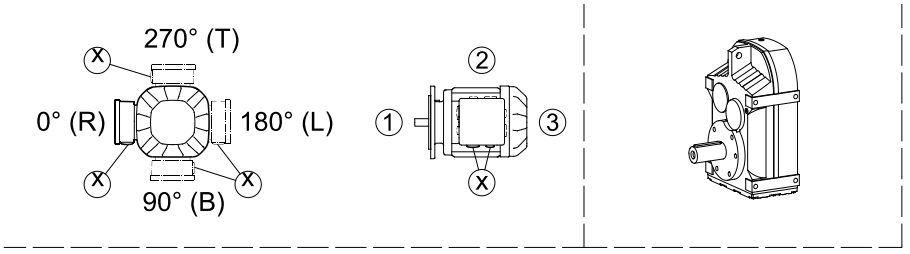
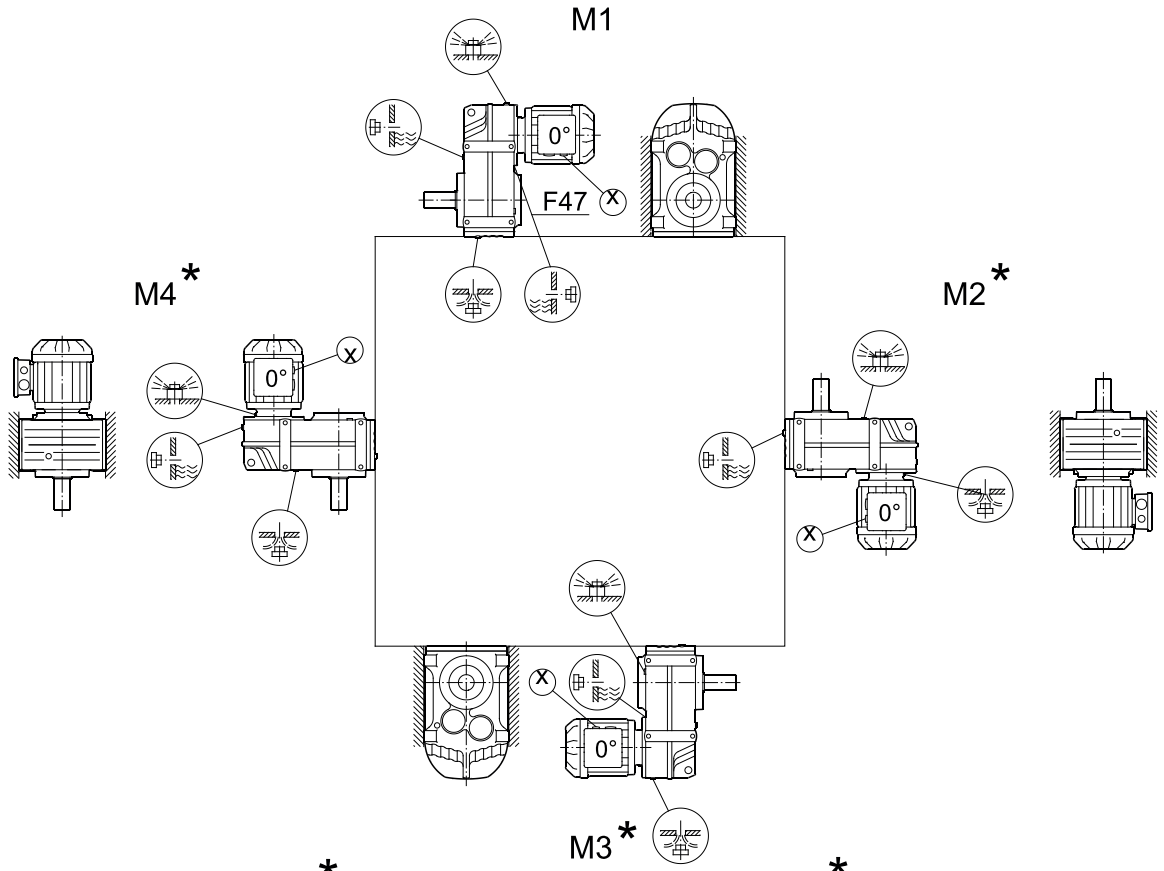
7.9.4 Mounting positions of parallel-shaft helical gear units

F/FA..B/FH27B – 157B, FV27B – 107B

42 042 04 00





F..27		M1, M3, M5, M6
F..27		M1 - M6
F..27		M1, M3, M5, M6

* (→ 🗎 146)

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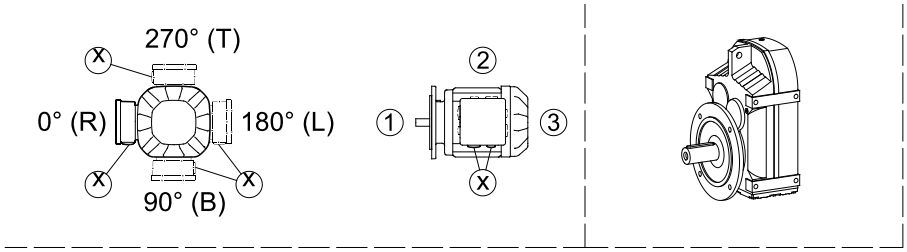
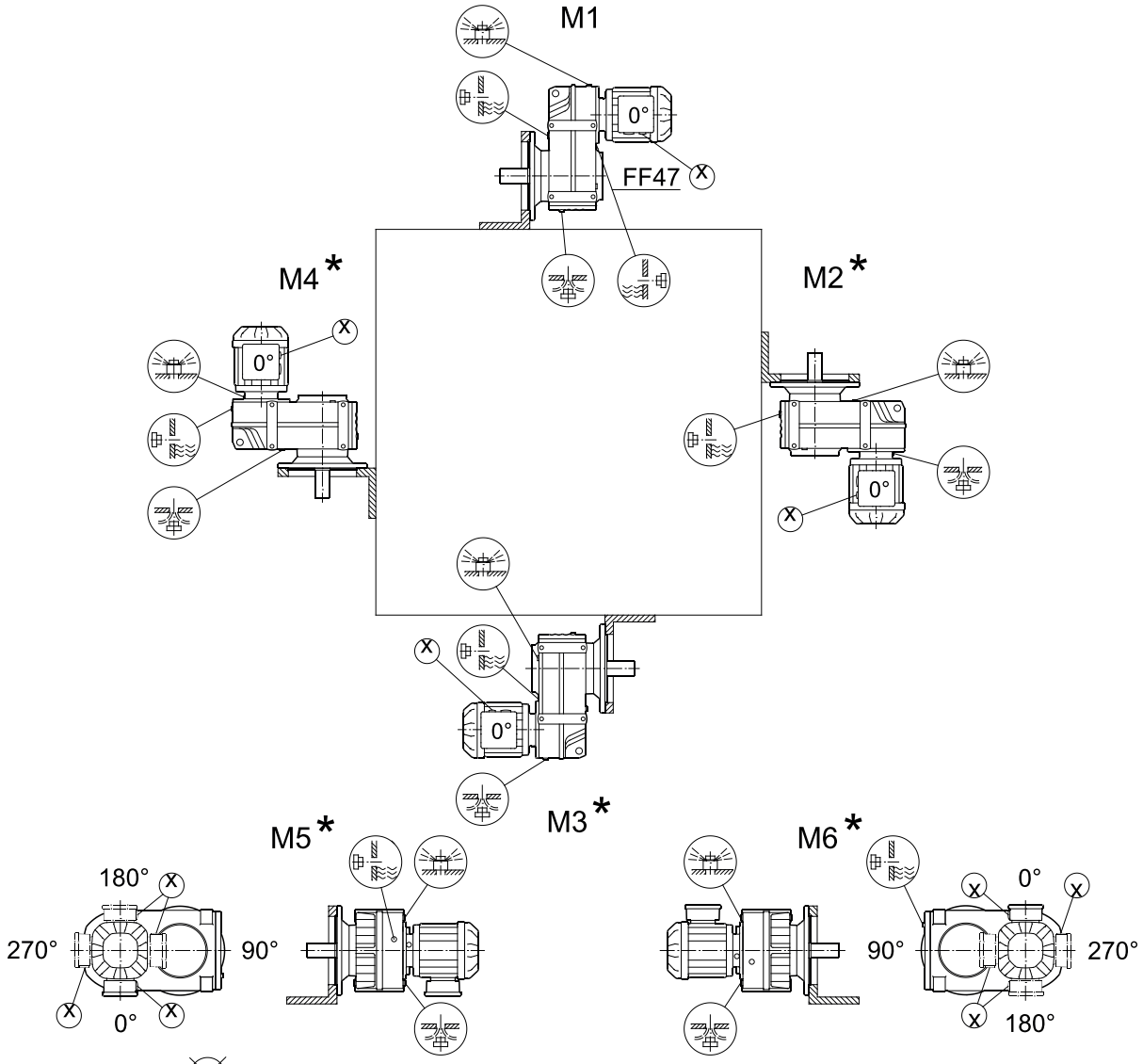
FF/FAF/FHF/FZ/FAZ/FHZ27 – 157, FVF/FVZ27 – 107, FM/FAM67 – 157

42 043 04 00





F..27		M1, M3, M5, M6
F..27		M1 - M6
F..27		M1, M3, M5, M6

* (→ 🗎 146)

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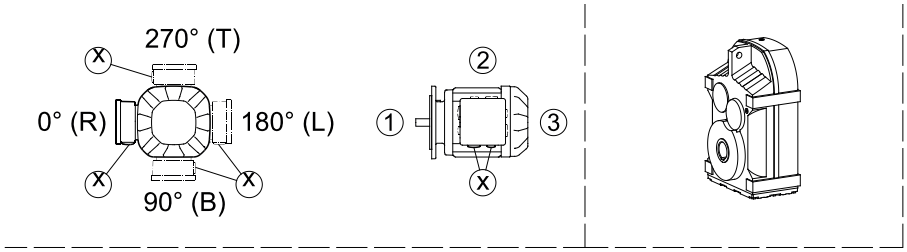
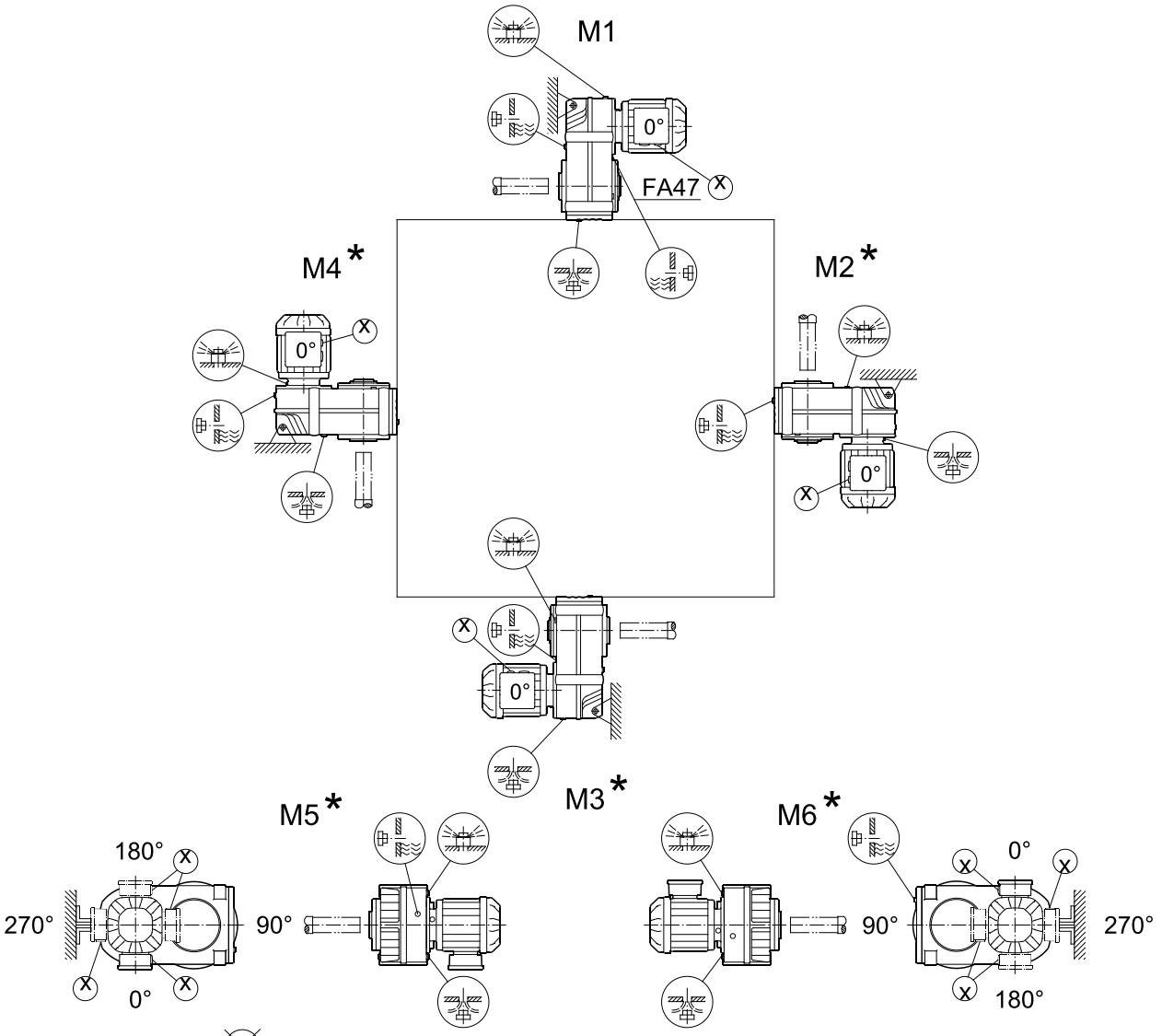
FA/FH27 – 157, FV27 – 107, FT37 – 157

42 044 04 00





F..27		M1, M3, M5, M6
F..27		M1 - M6
F..27		M1, M3, M5, M6

* (→ 🗎 146)

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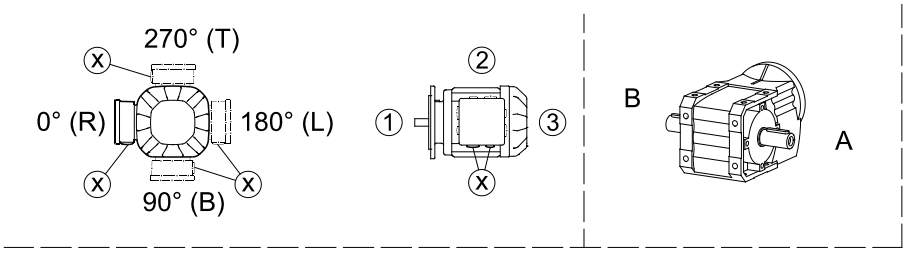
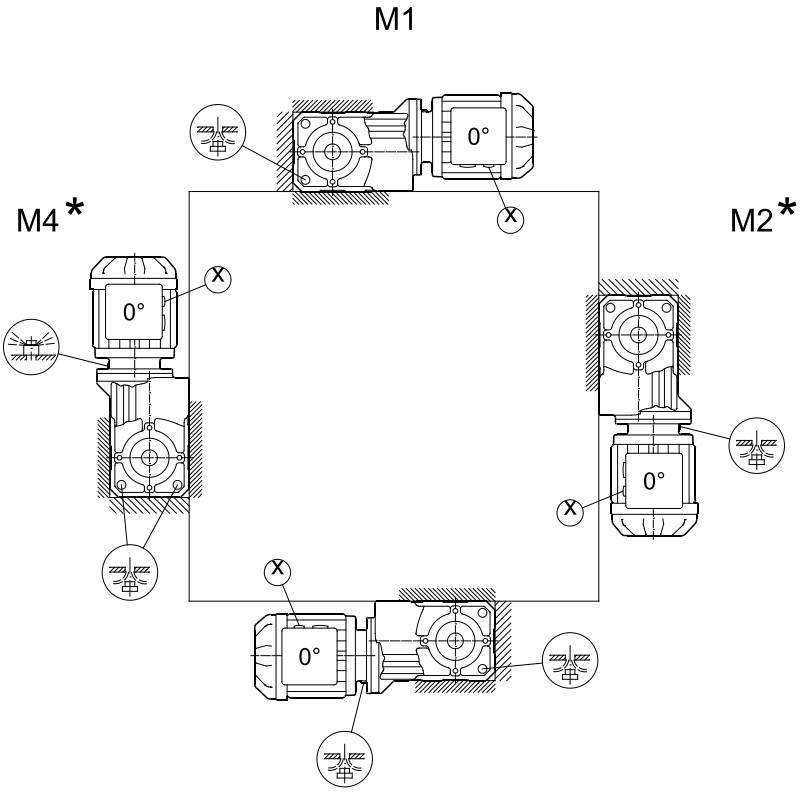
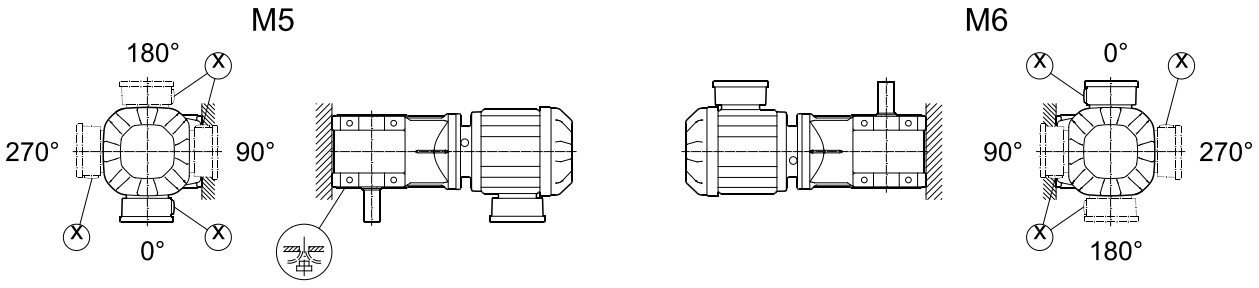
7.9.5 Mounting positions of helical-bevel gear units

K/KA..B/KH19B – 29B

33 023 00 15







* (→ 🗎 146)

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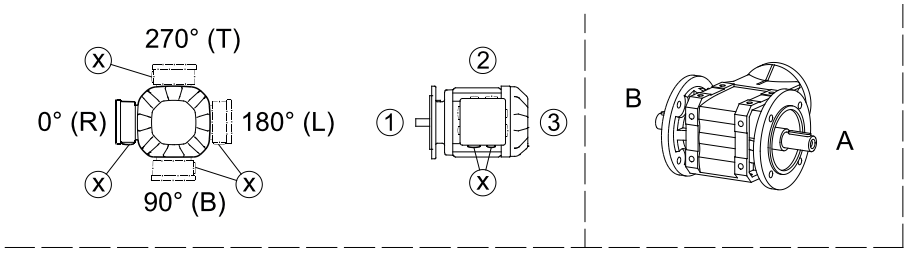
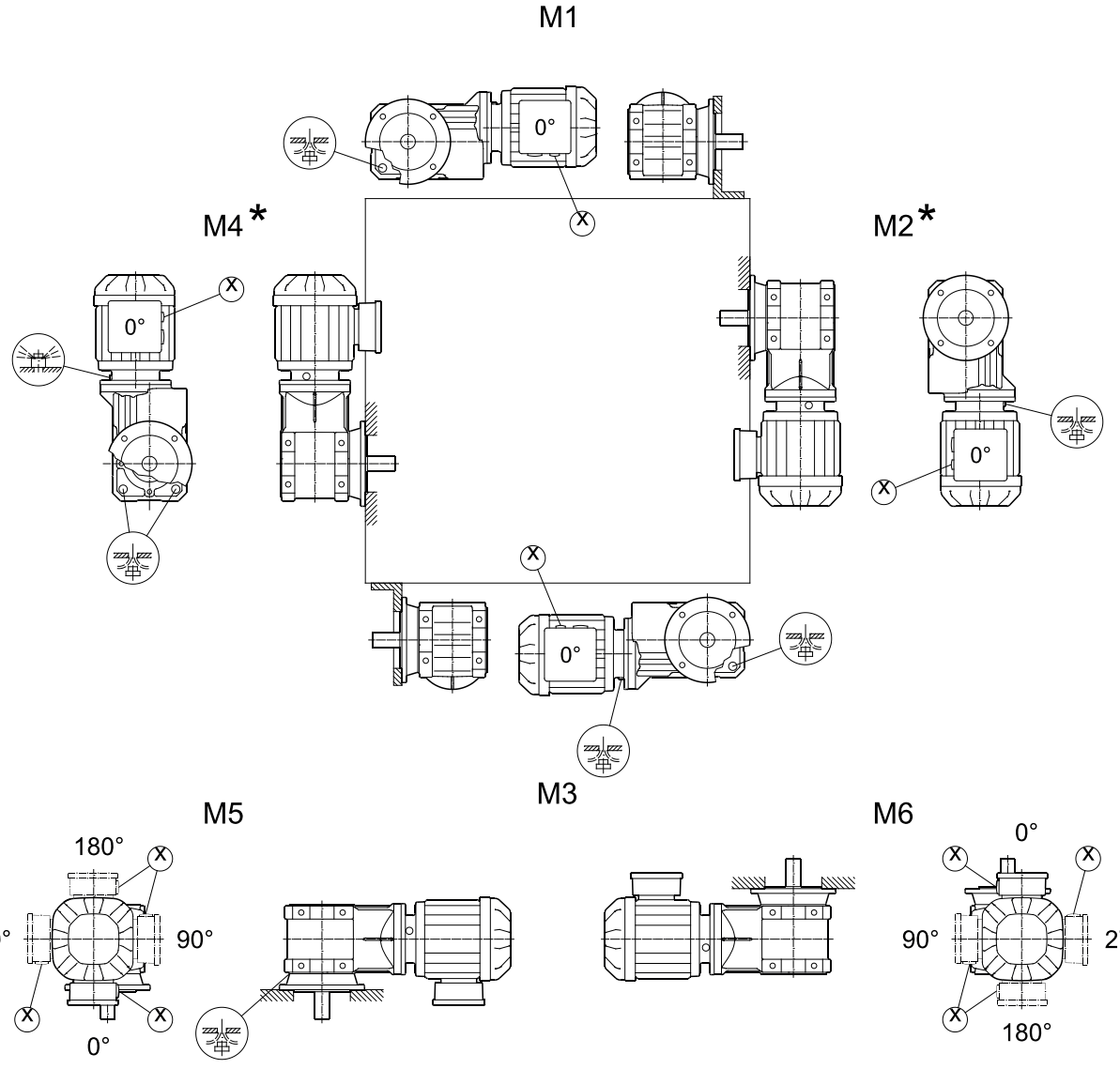
KF..B/KAF..B/KHF19B – 29B

33 024 00 15





* (→ 146)

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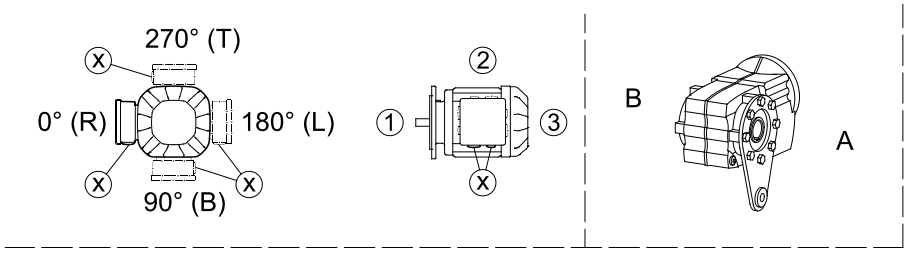
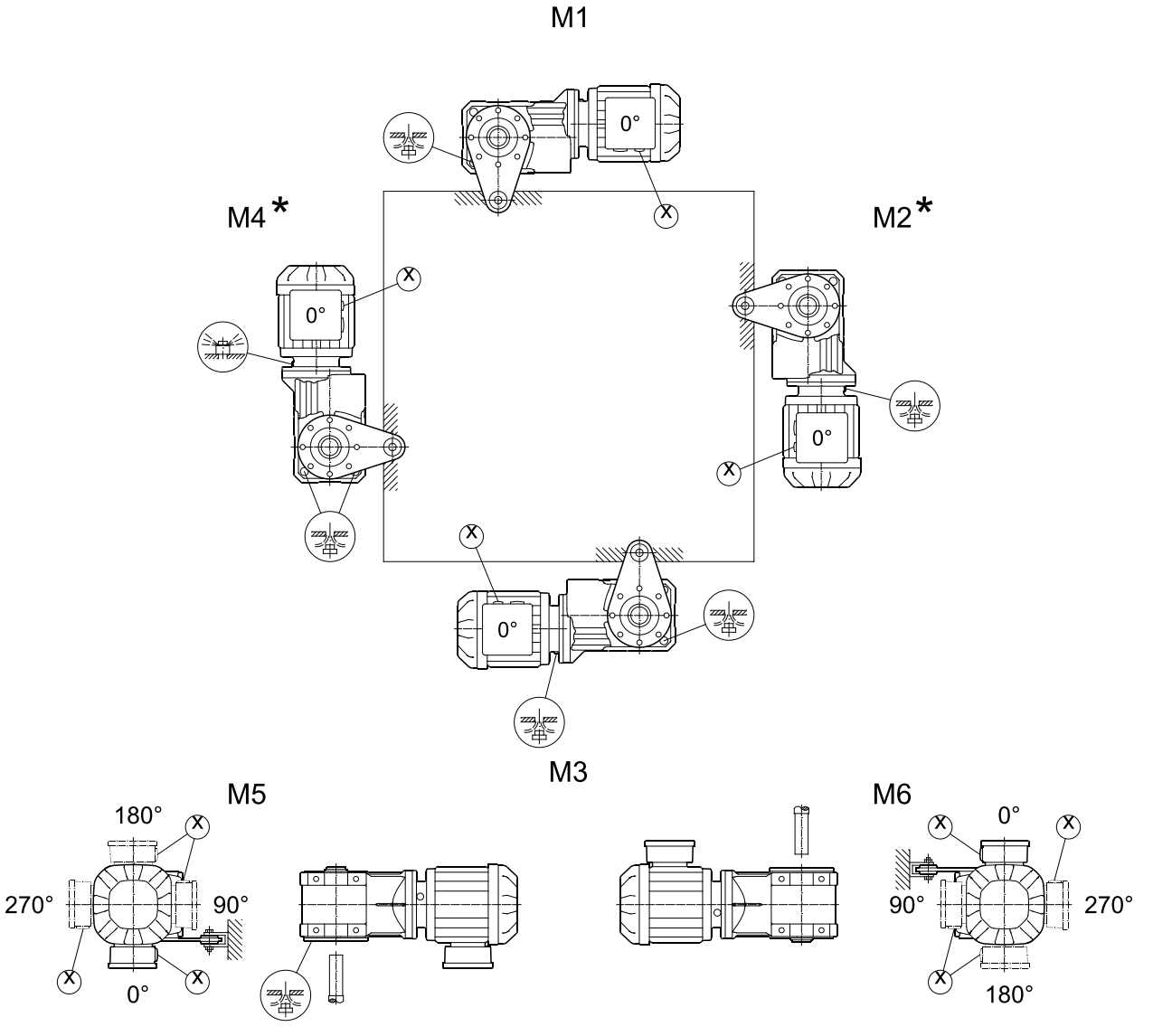
KA..B/KH19B – 29B

33 025 00 15

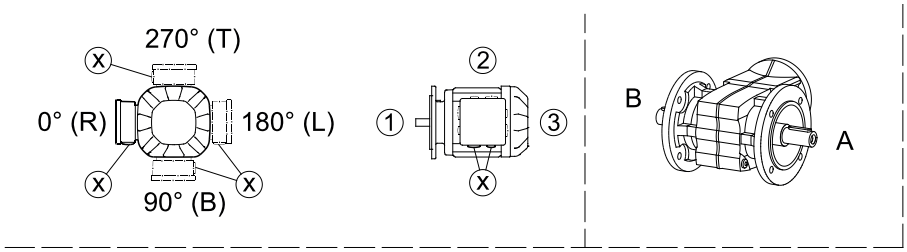


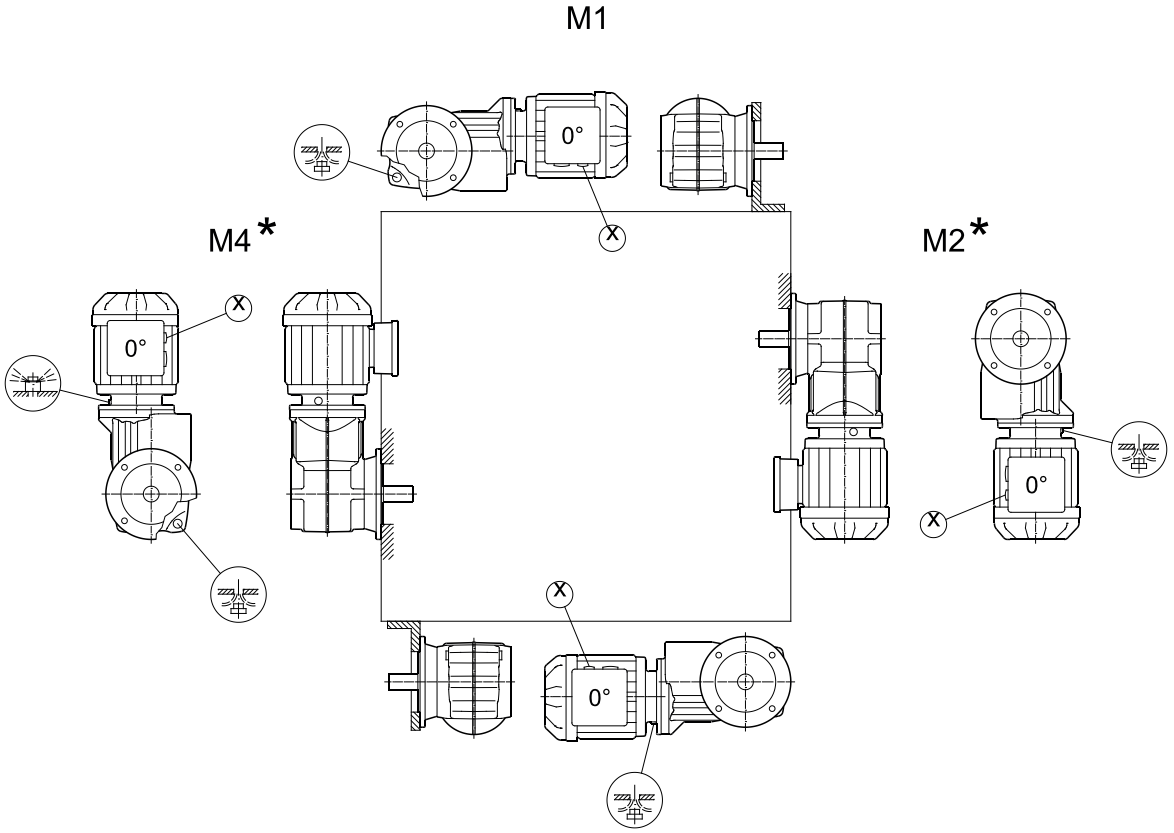


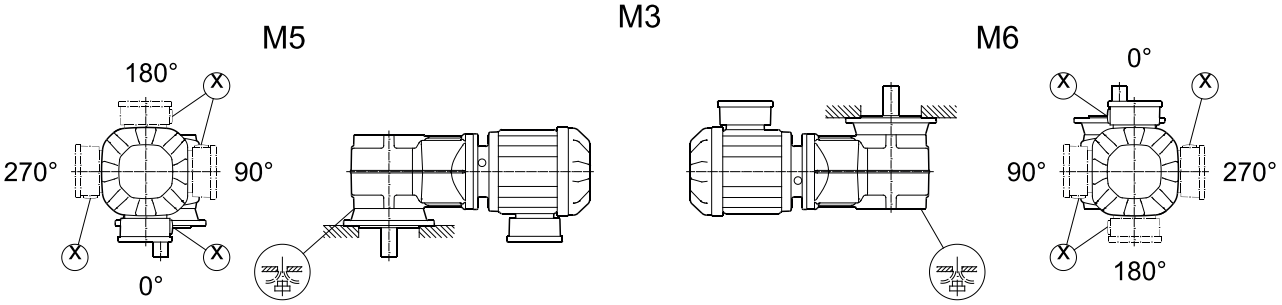
* (→ 🖹 146)

KF/KAF/KHF19 – 29

33 026 00 15





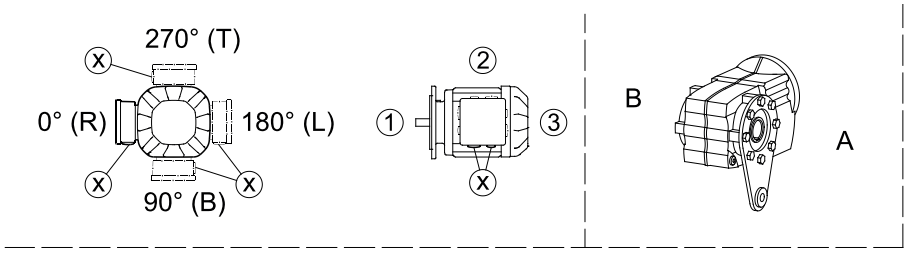


* (→ 146)

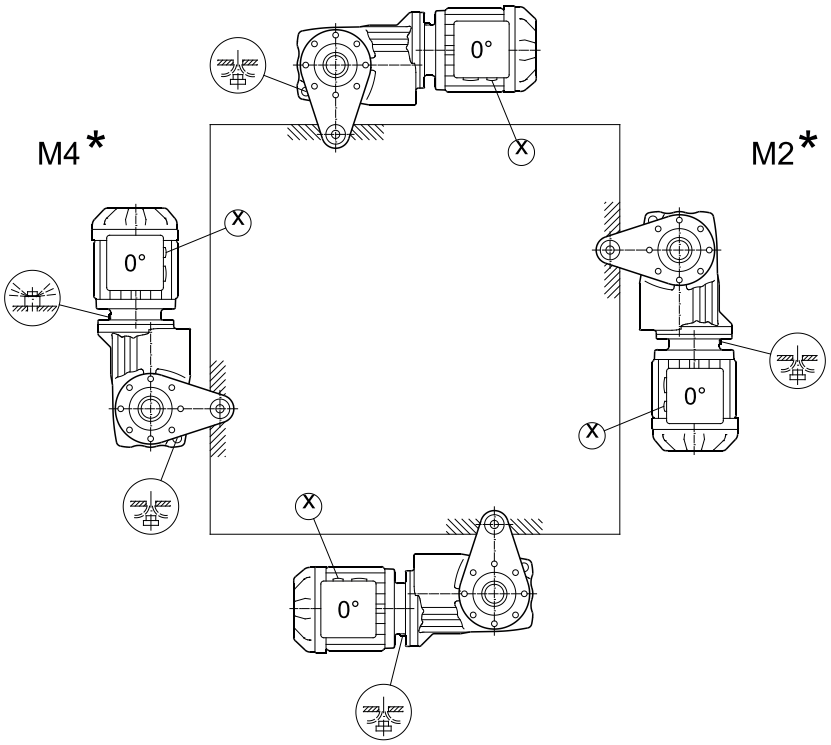
27784460/EN – 08/2022

KA/KH/KT19 – 29

33 027 00 15



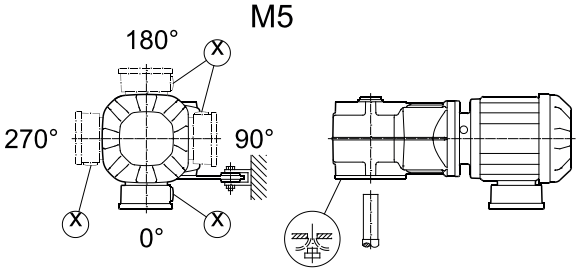
M1



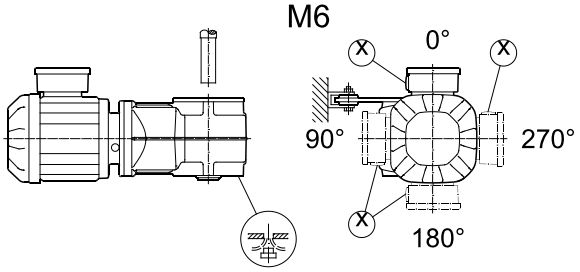
M4 * M2 *

M3

M5



M6

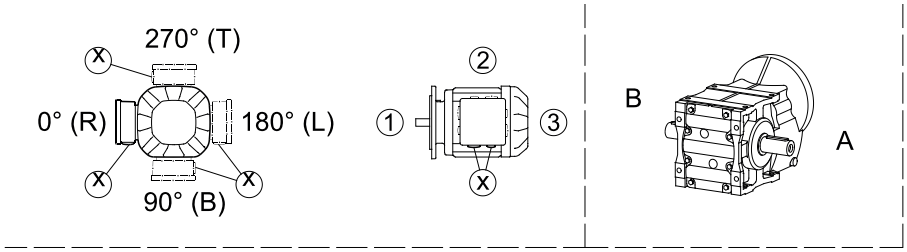


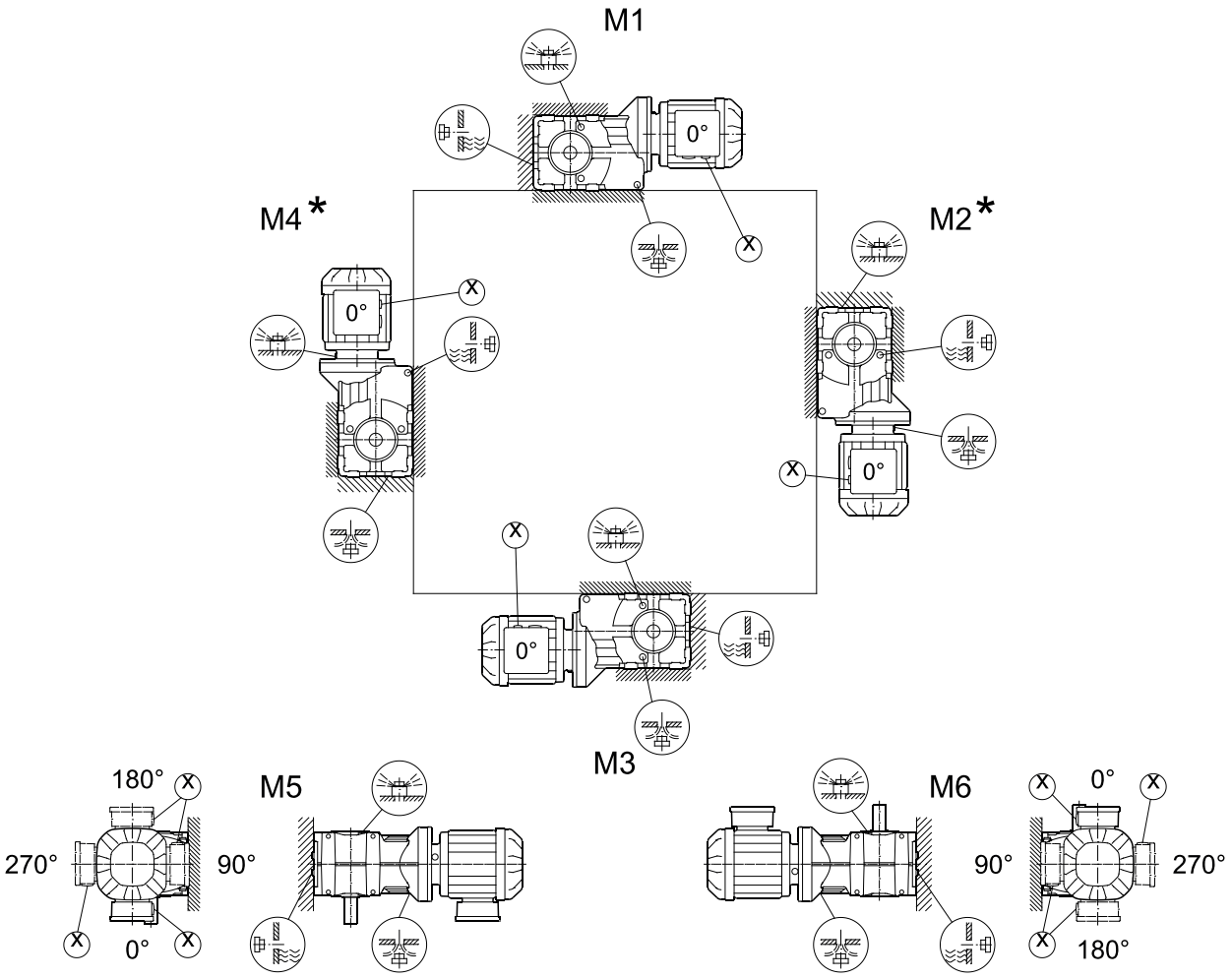
* (→ 🖹 146)

27784460/EN – 08/2022

K/KA..B39 – 49

33 092 03 14



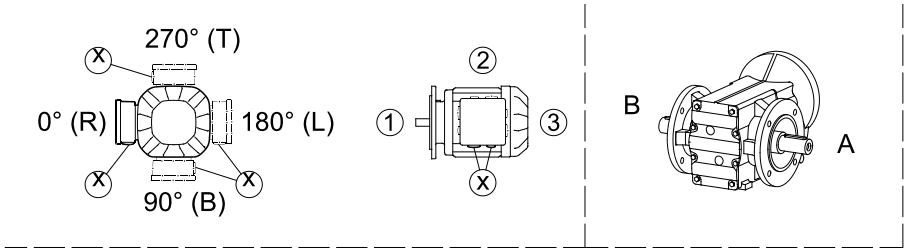


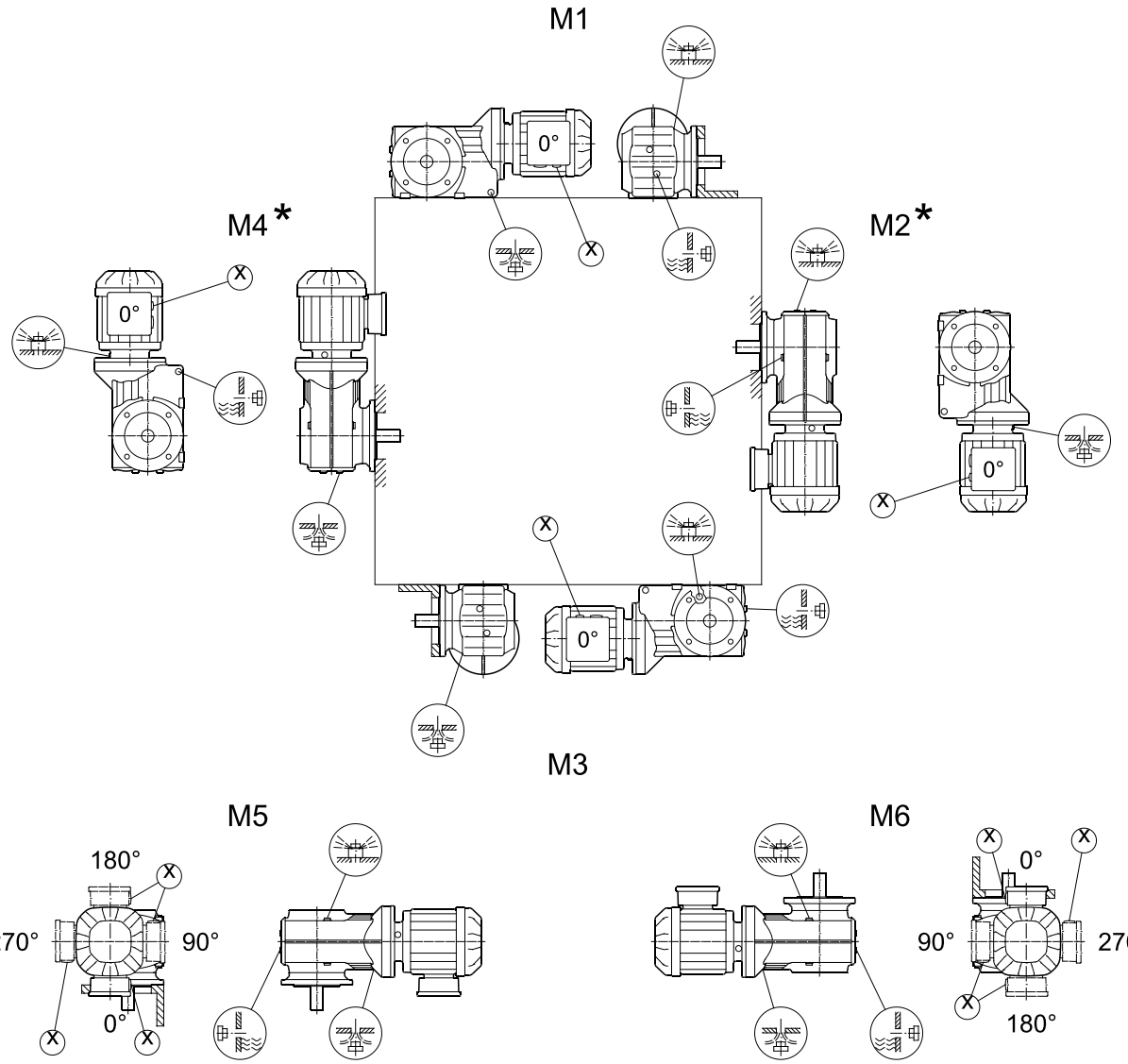
* (→ 🖹 146)

27784460/EN – 08/2022

KF/KAF/KHF39 – 49

33 093 01 14



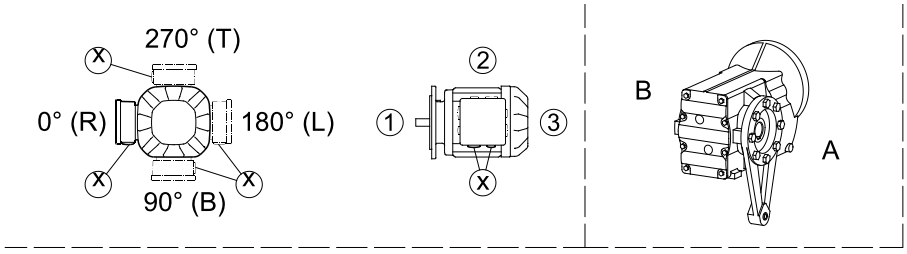


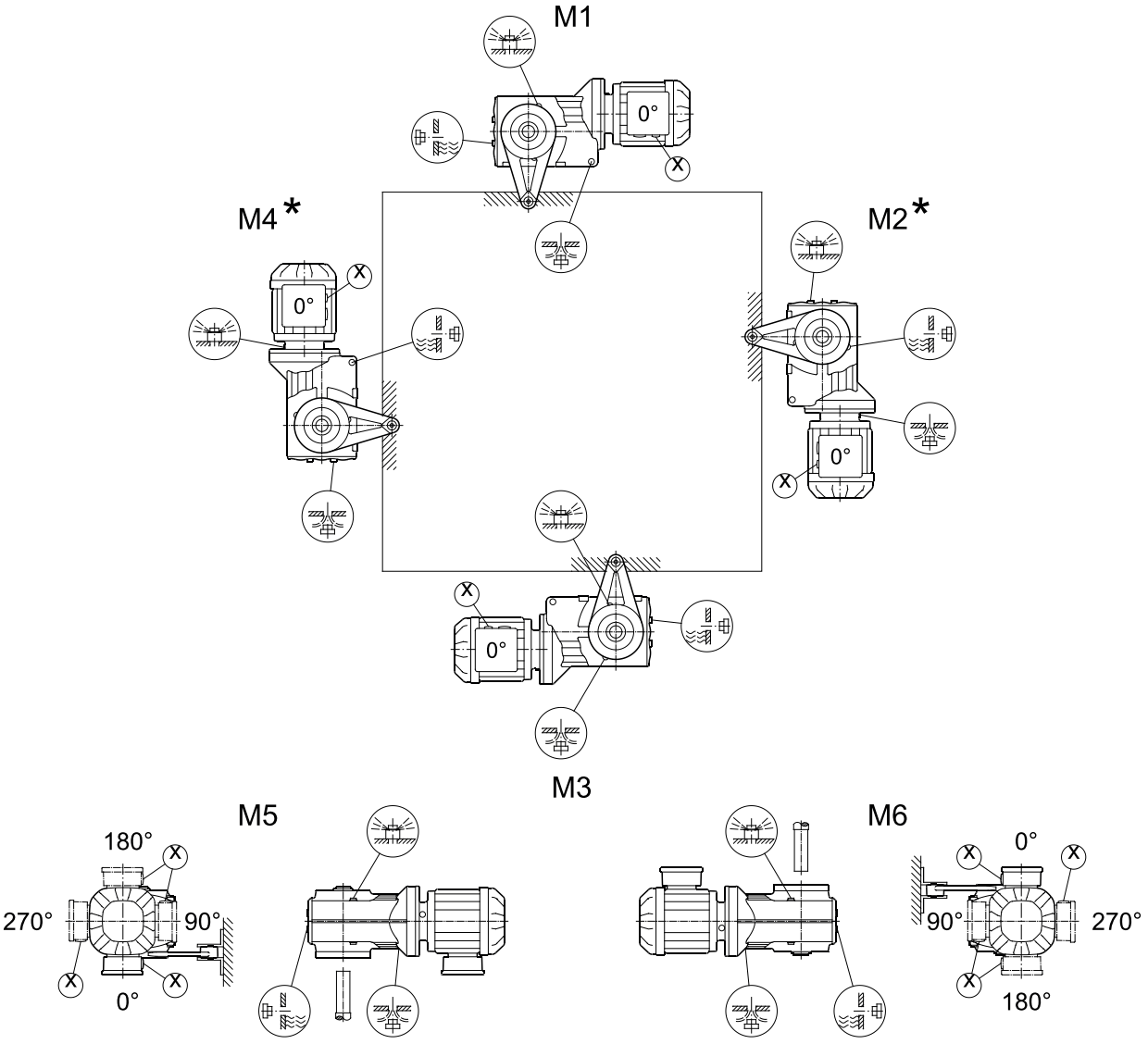
* (→ 🗎 146)

27784460/EN – 08/2022

KA/KH/KT39 – 49

33 094 01 14



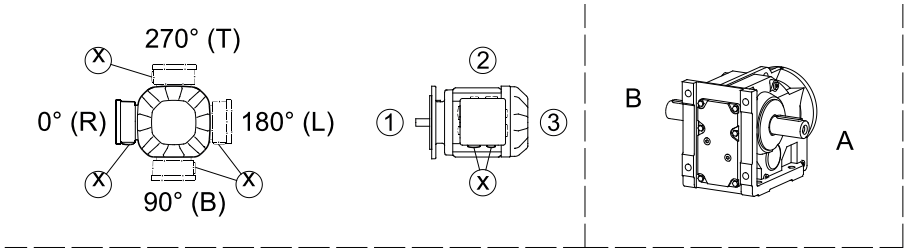


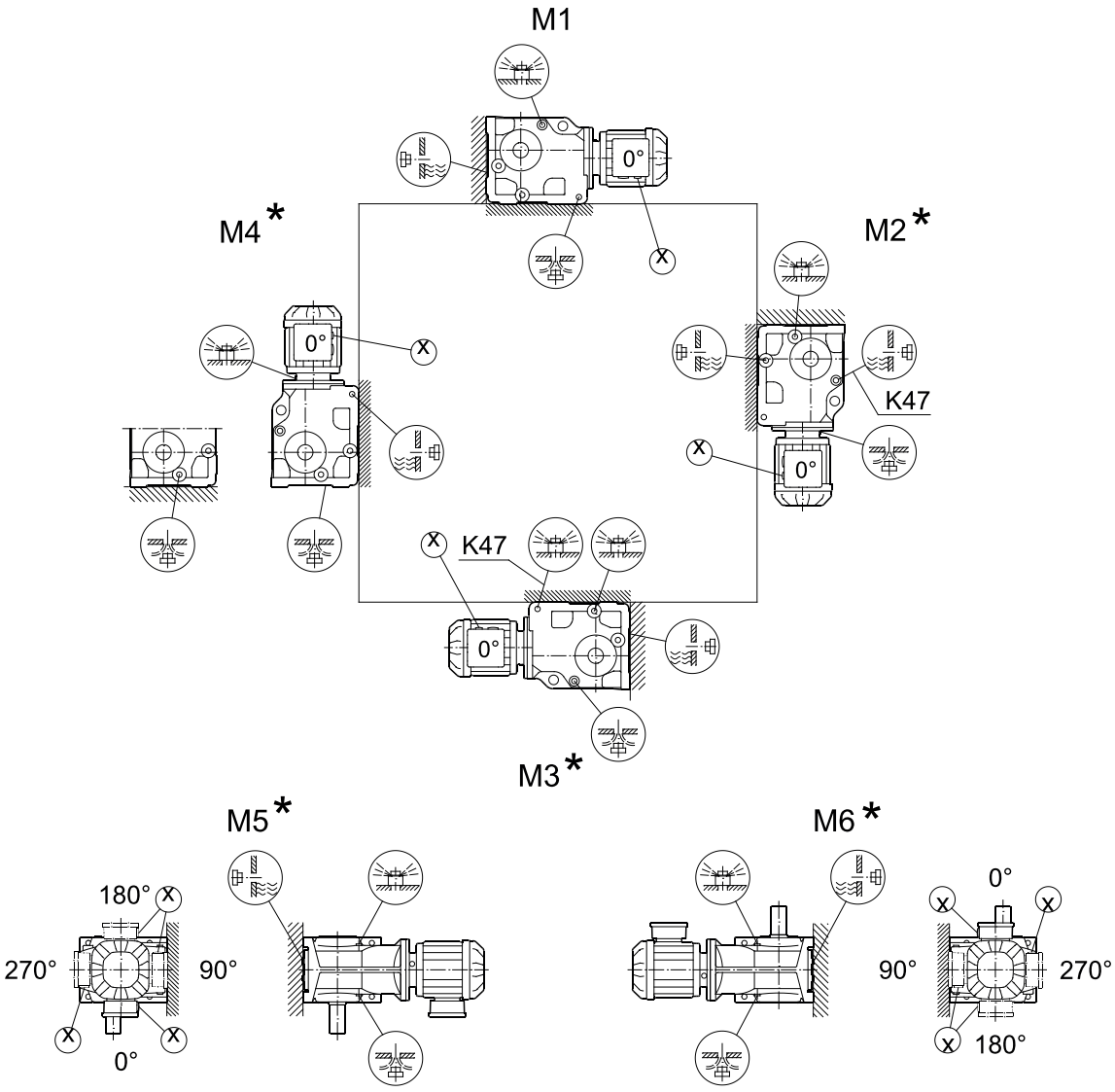
* (→ 146)

27784460/EN – 08/2022

K37 – 157, KA..B/KH47B – 157B, KV47B – 107B

34 025 05 00

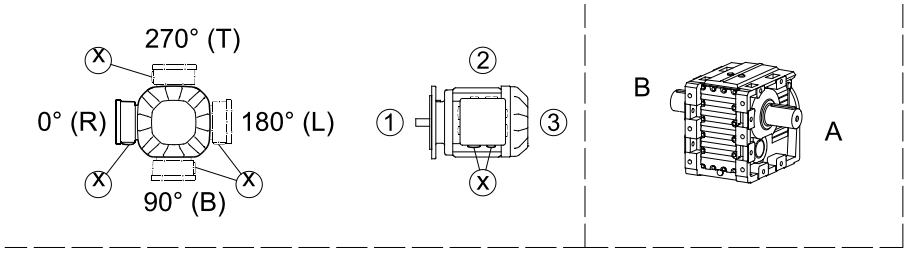


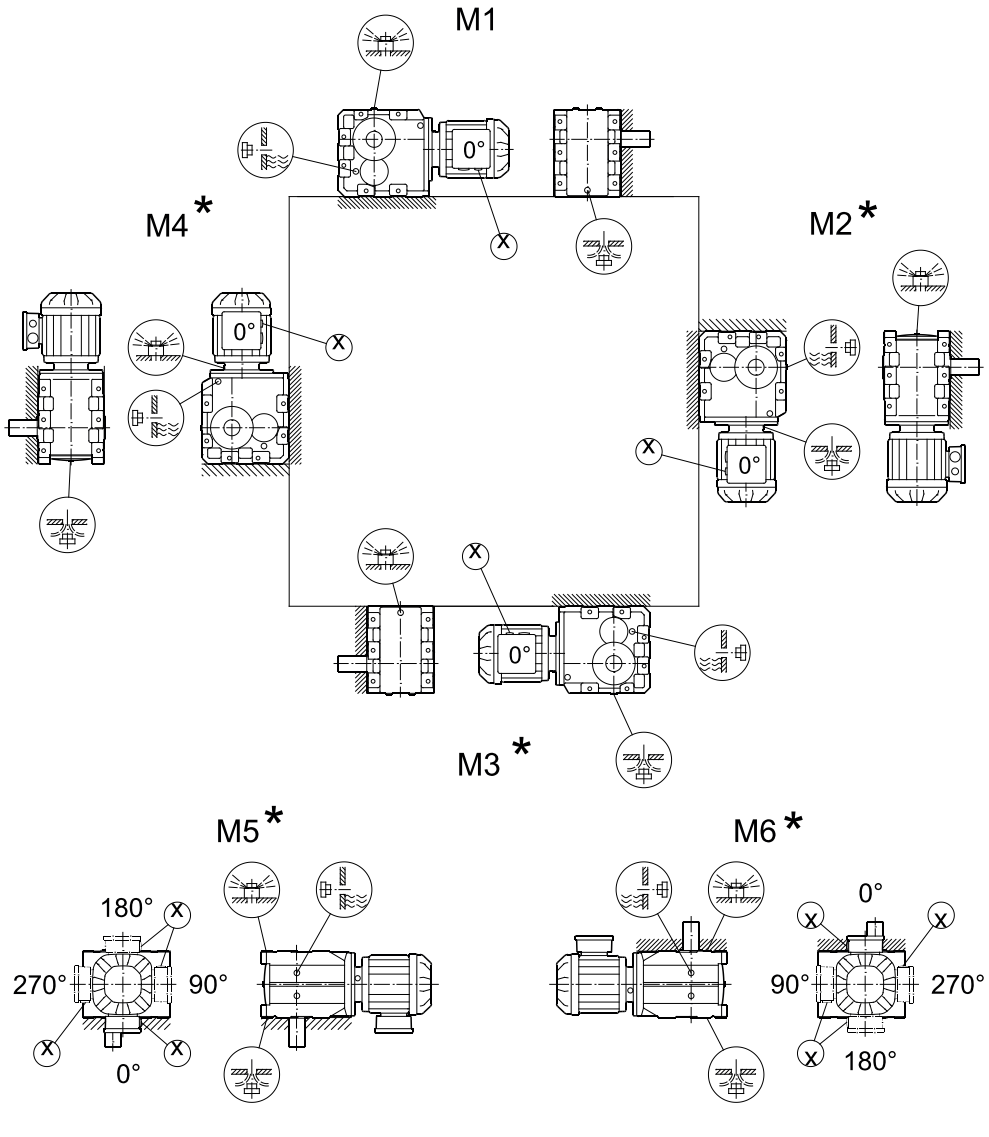


* (→ 🗎 146)

K167 – 187, KH167B – 187B

34 026 05 00



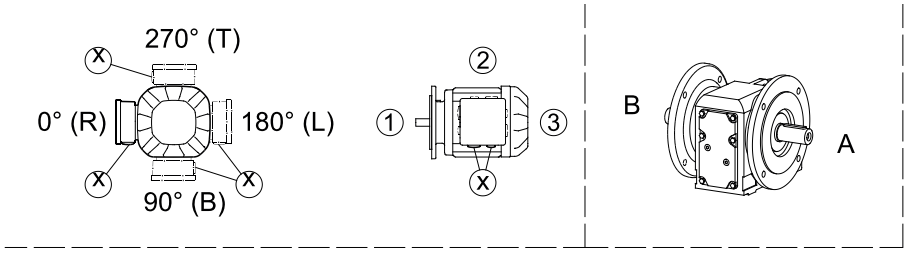


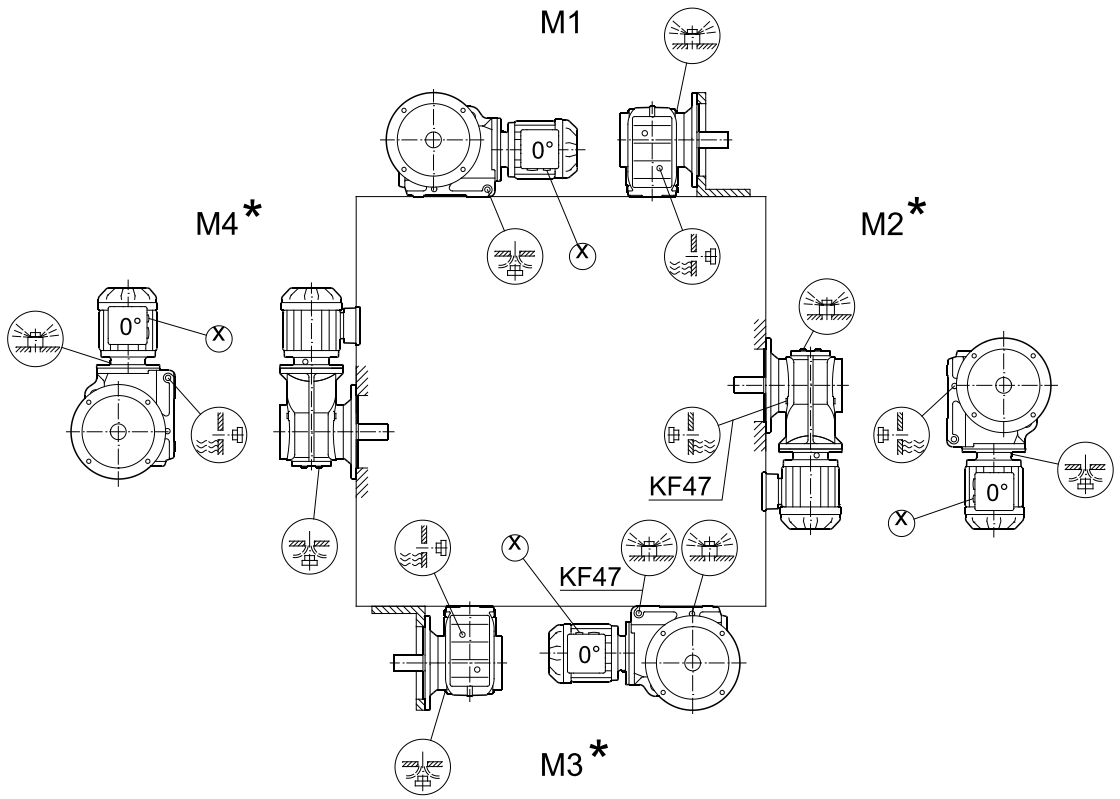
* (→ 🗎 146)

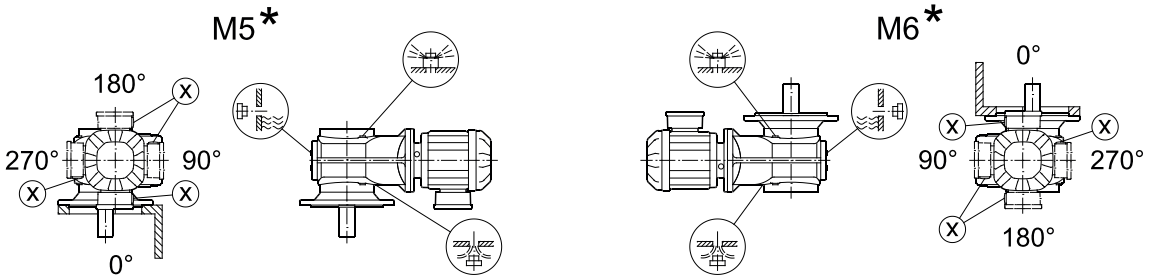
27784460/EN – 08/2022

KF/KAF/KHF/KZ/KAZ/KHZ37 – 157, KVF/KVZ37 – 107, KM/KAM67 – 157

34 027 04 00





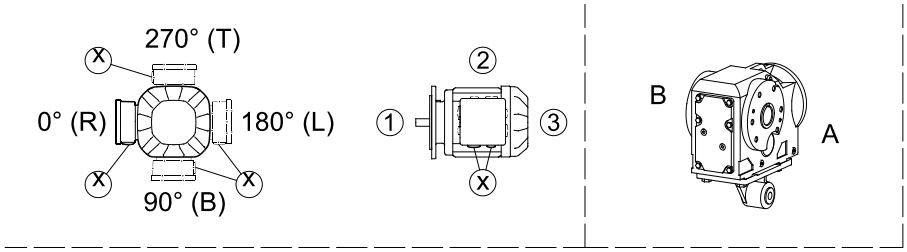


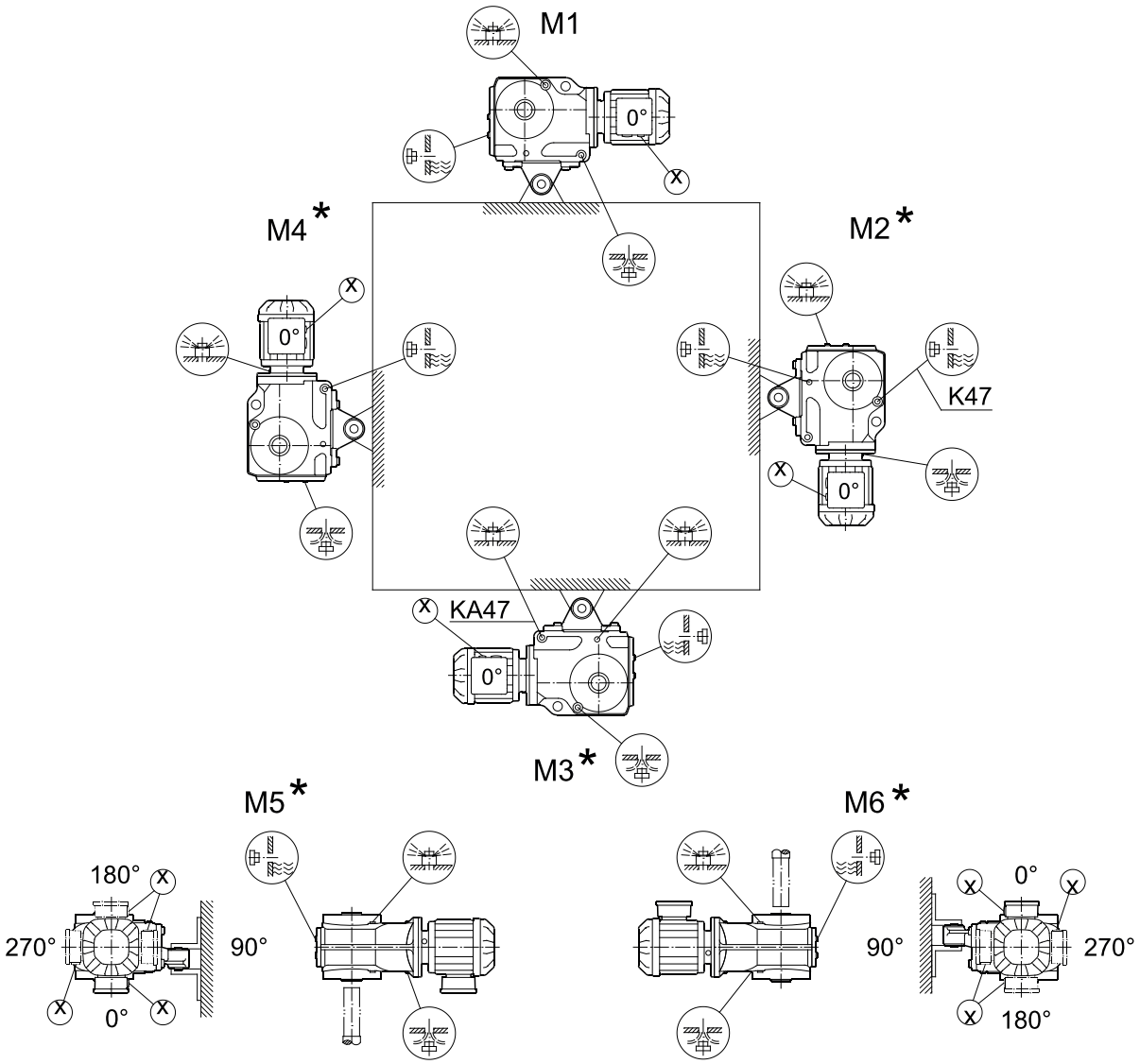
* (→ 🗎 146)

27784460/EN – 08/2022

KA/KH37 – 157, KV37 – 107, KT37 – 157

39 025 05 00



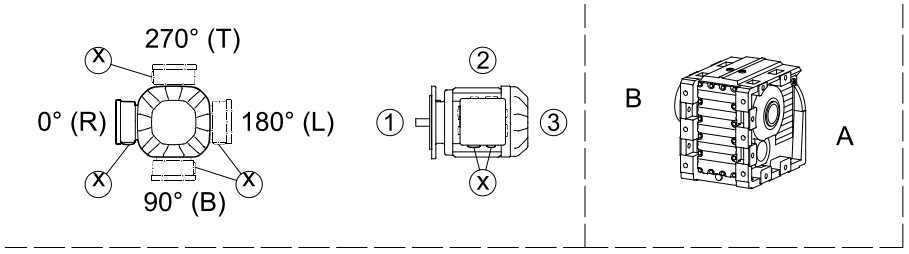


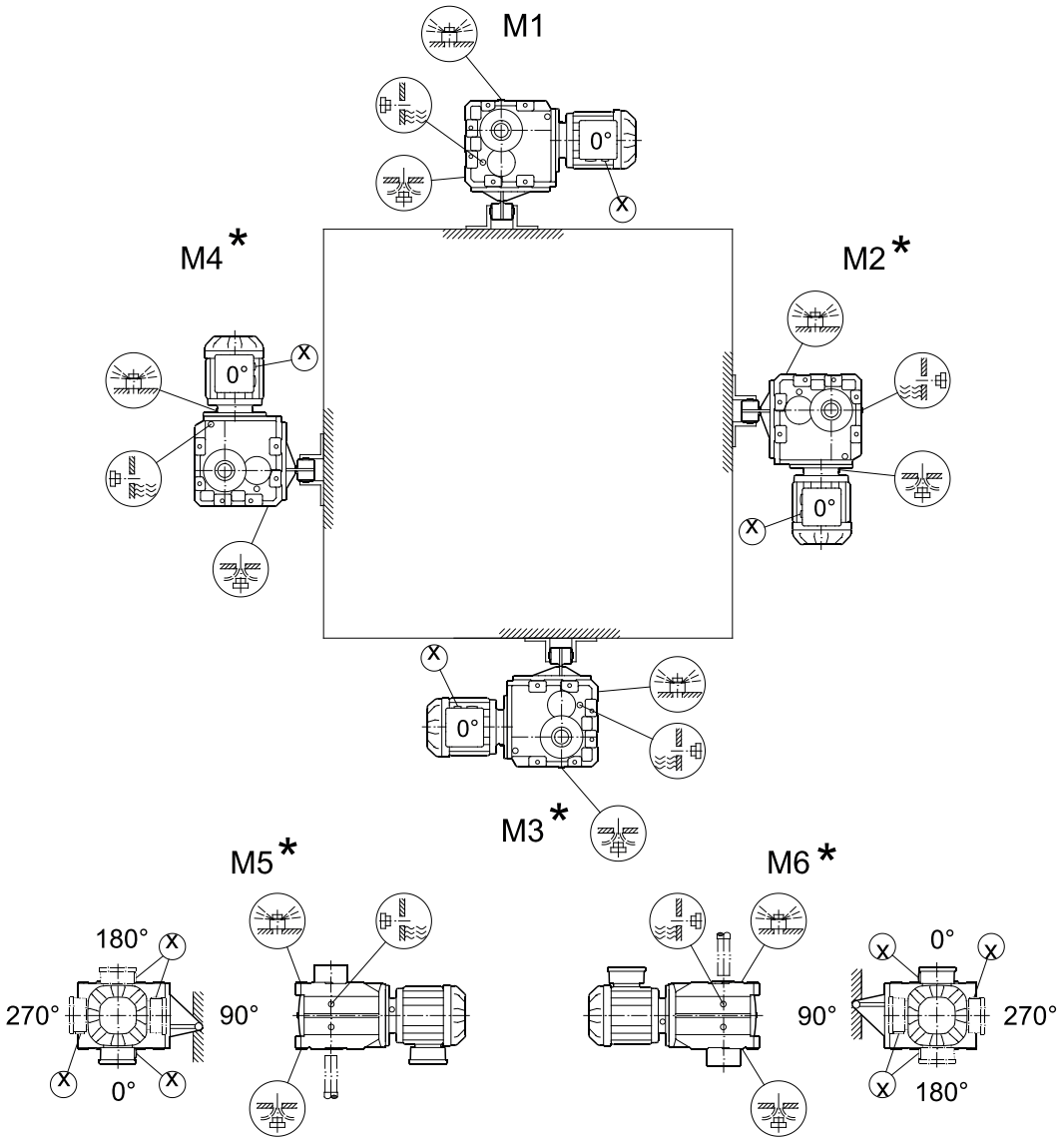
* (→ 146)

27784460/EN – 08/2022

KH167 – 187

39 026 05 00





* (→ 🗎 146)

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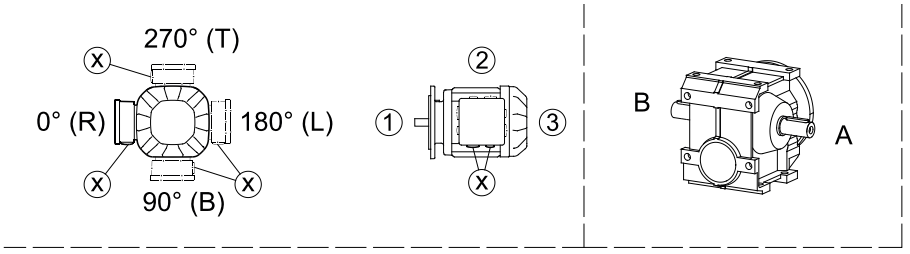
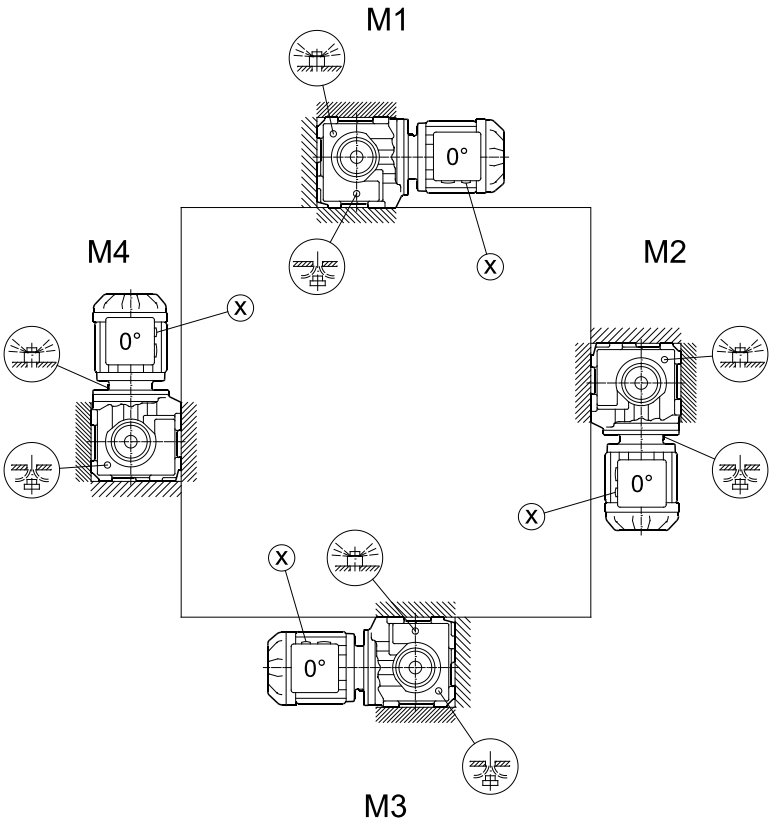
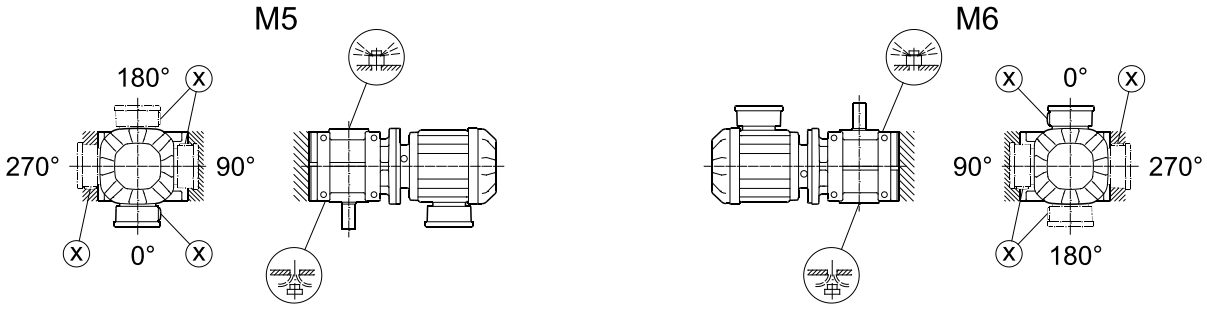
7.9.6 Mounting positions of helical-worm gear units

S37

05 025 05 00







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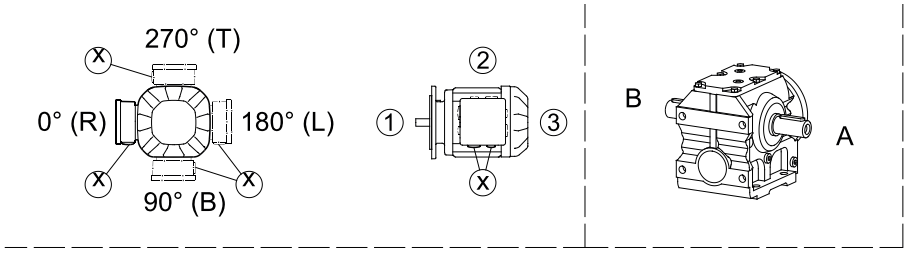
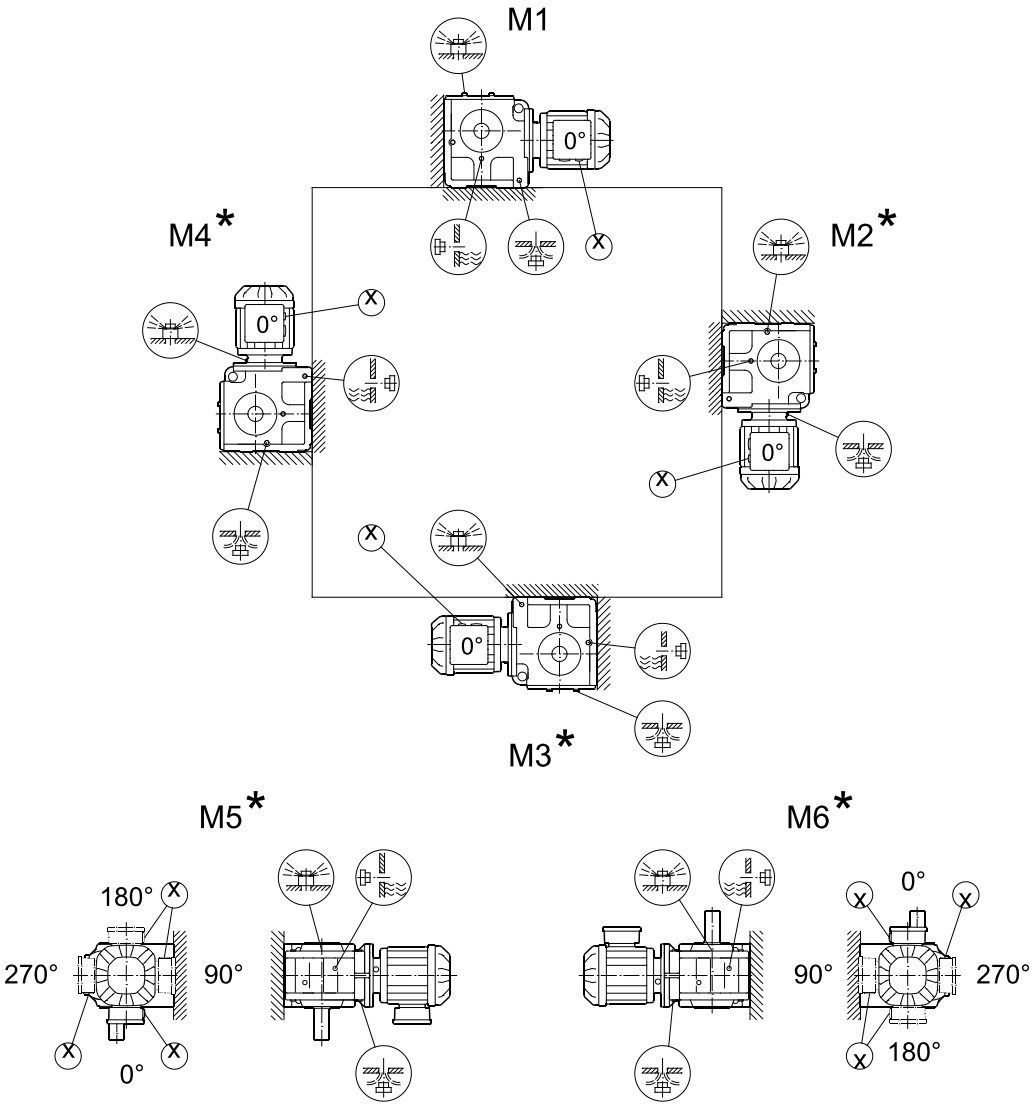
S47 – S97

05 026 04 00

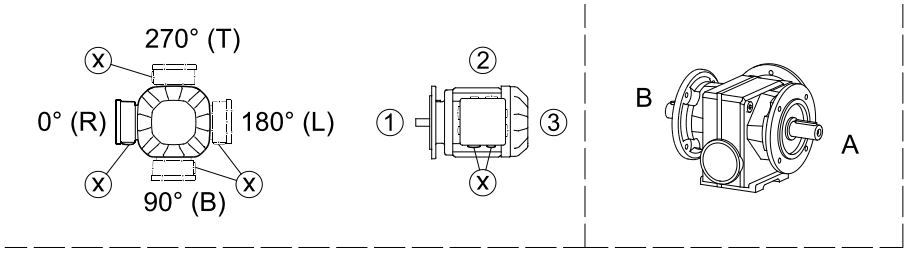


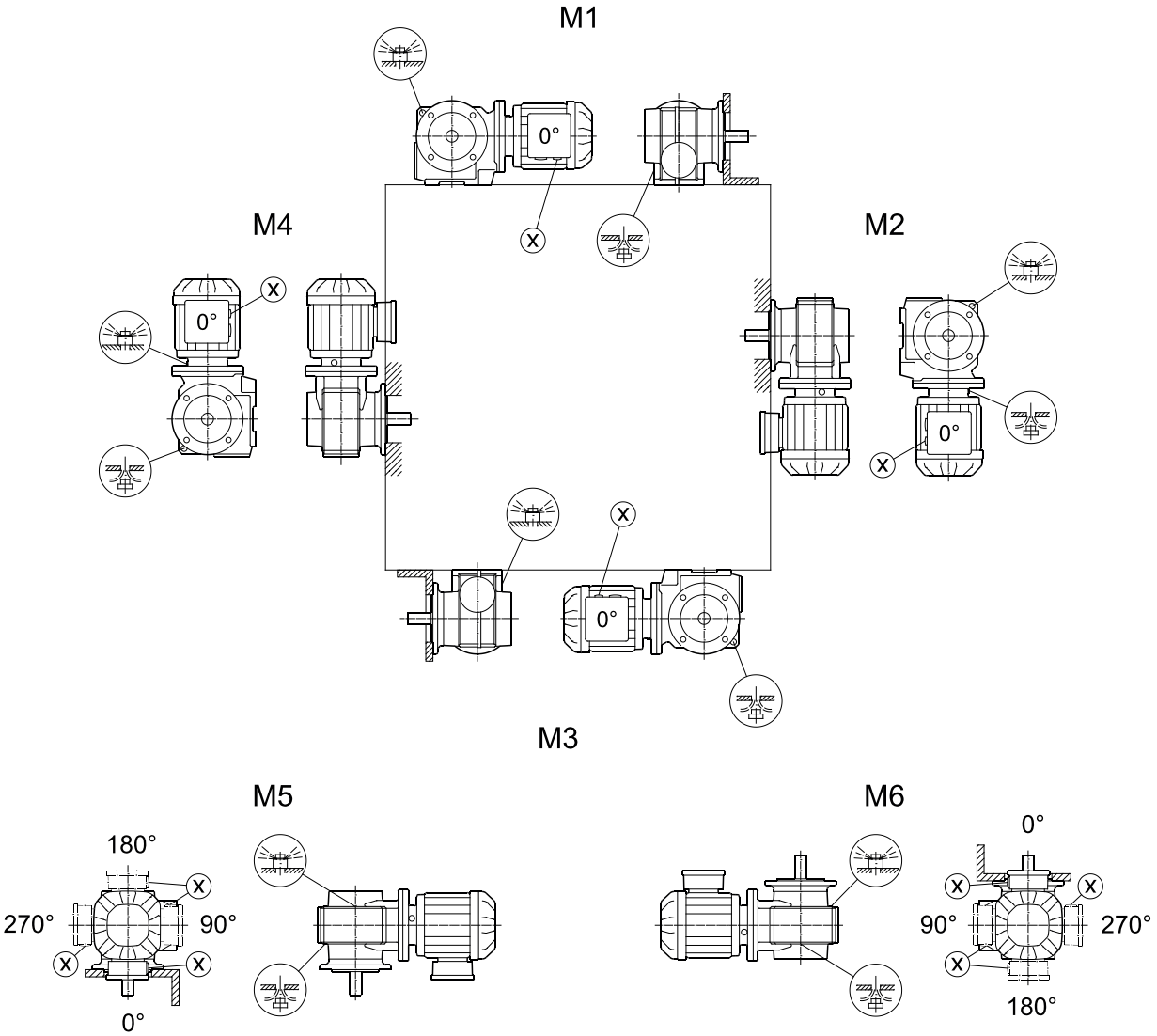


* (→ 🗎 146)

SF/SAF/SHF37

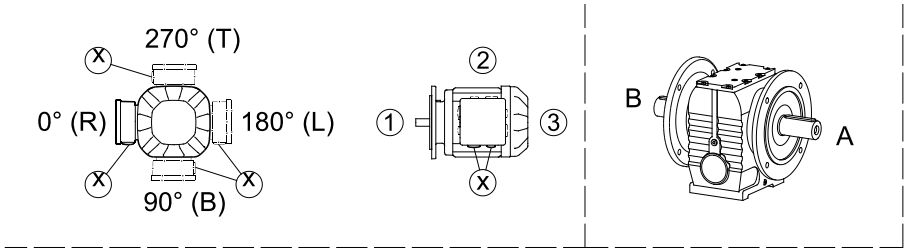
05 027 05 00

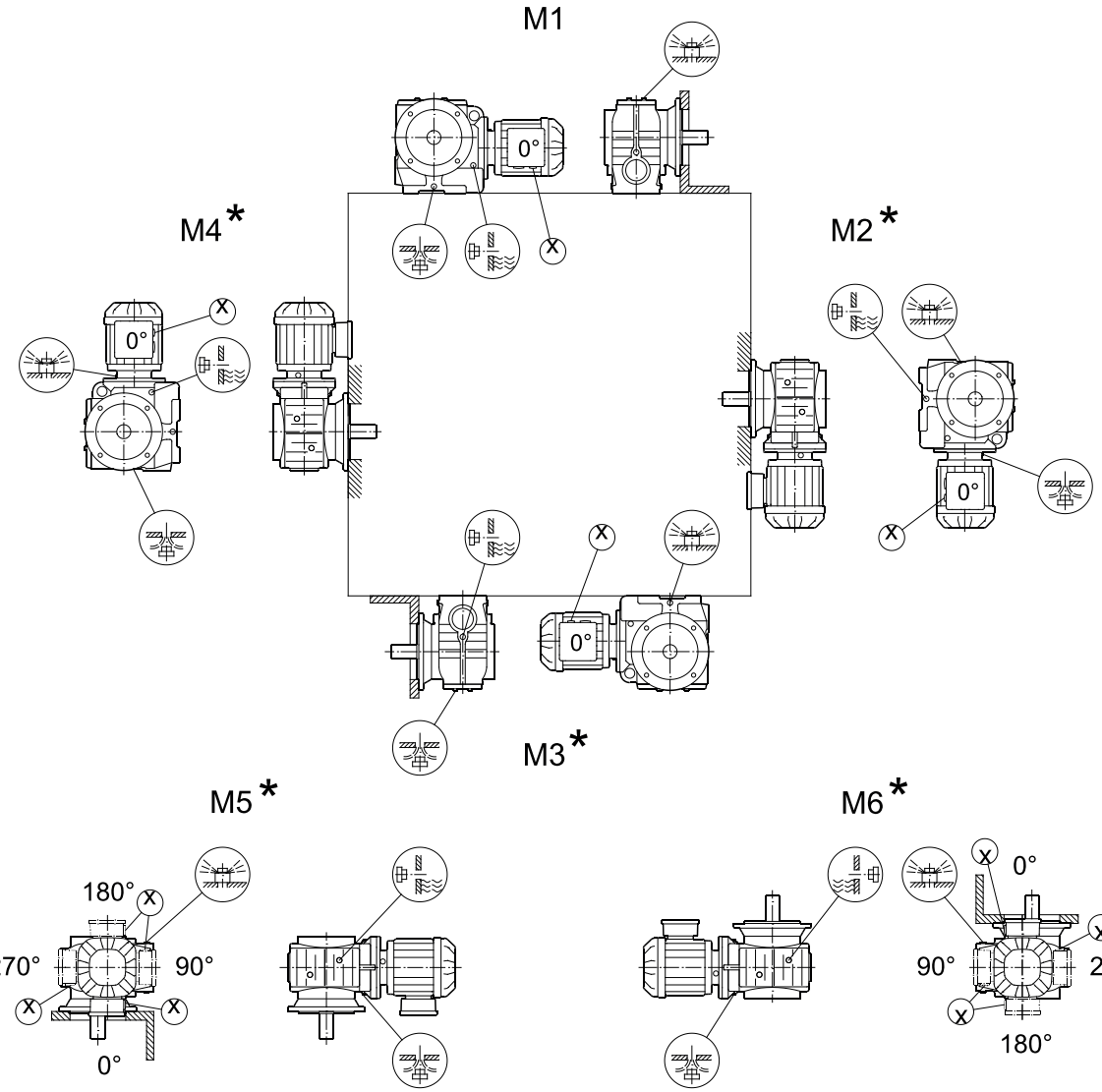




SF/SAF/SHF/SAZ/SHZ47 – 97

05 028 04 00

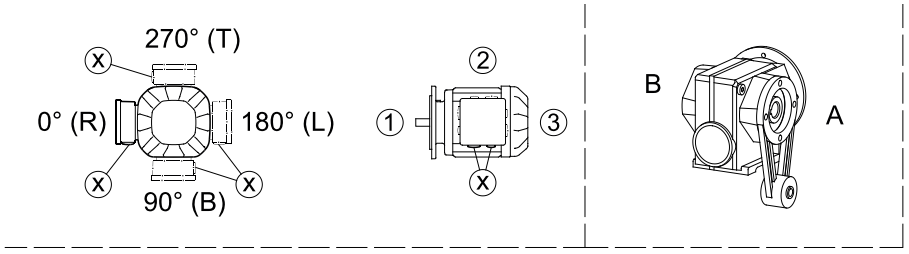


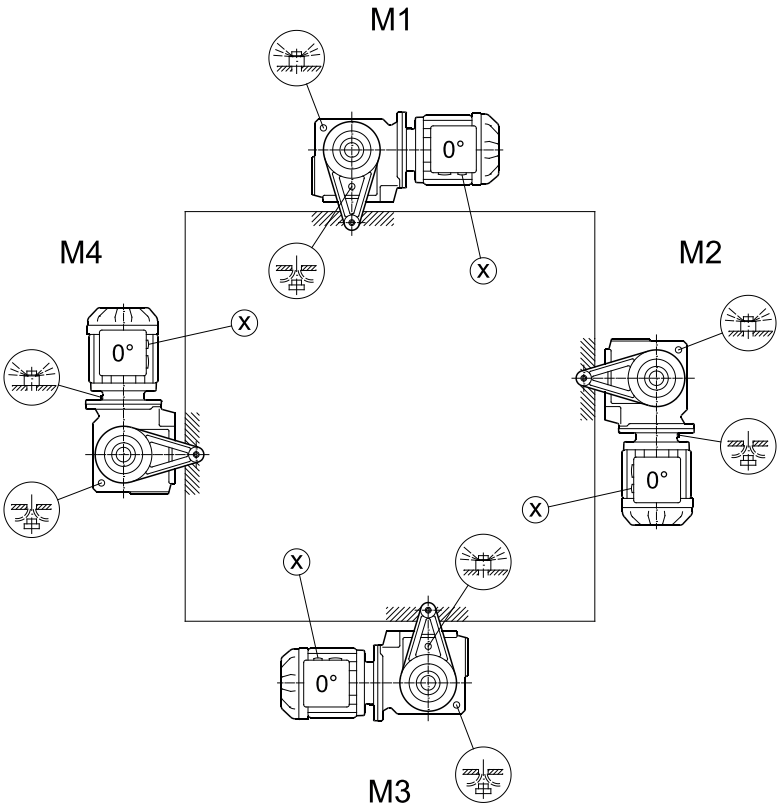


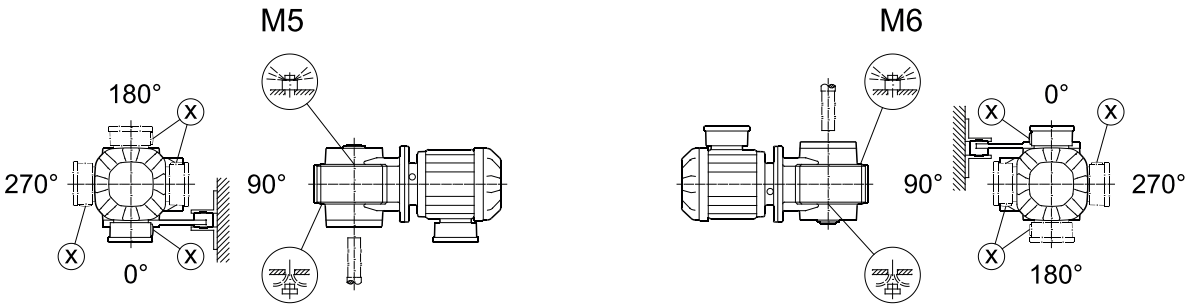
* (→ 🗎 146)

SA/SH/ST37

28 020 06 00







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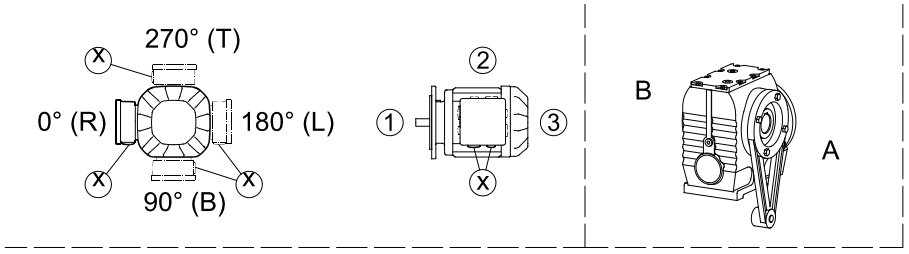
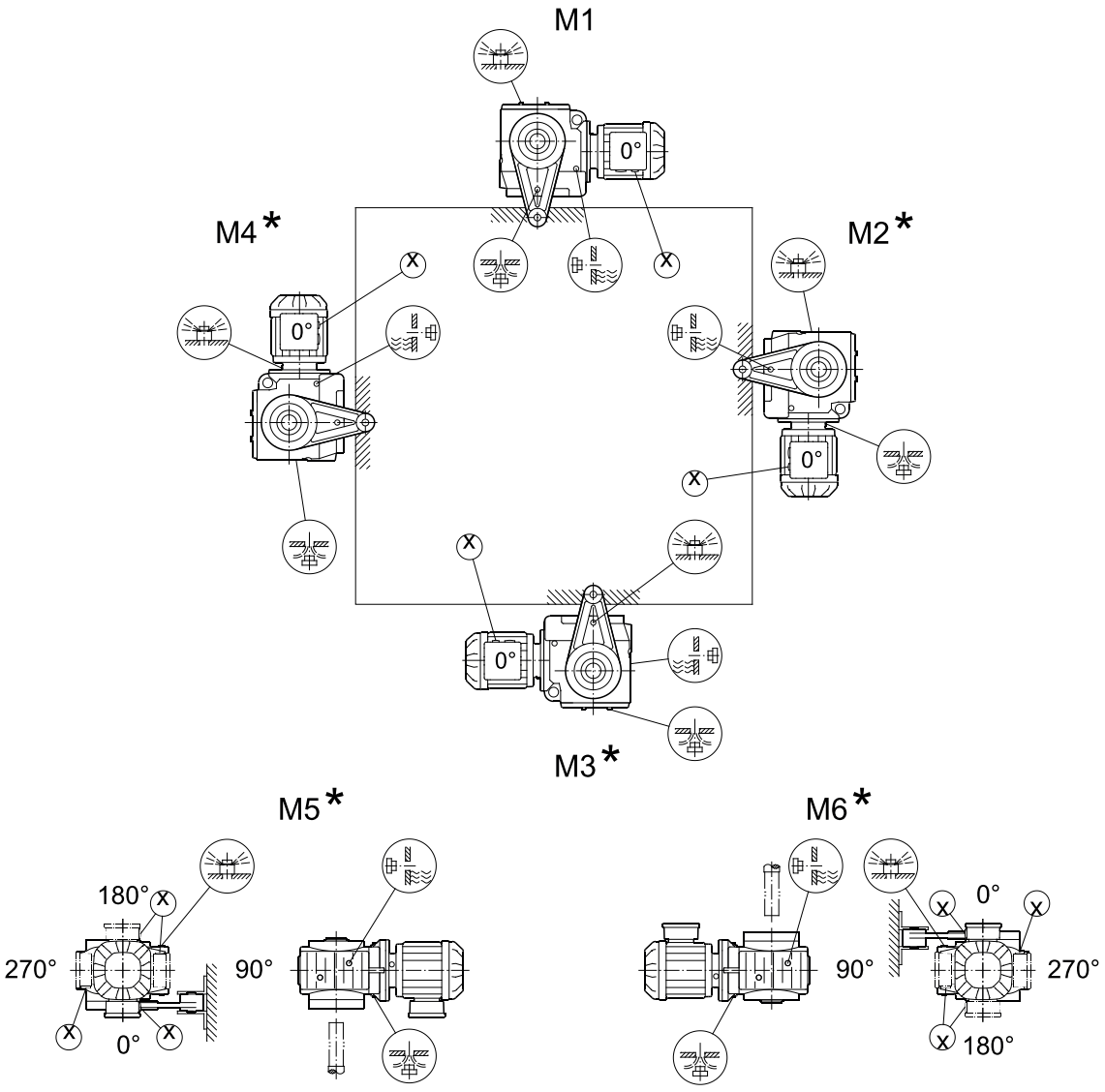
SA/SH/ST47 – 97

28 021 04 00





* (→ 146)

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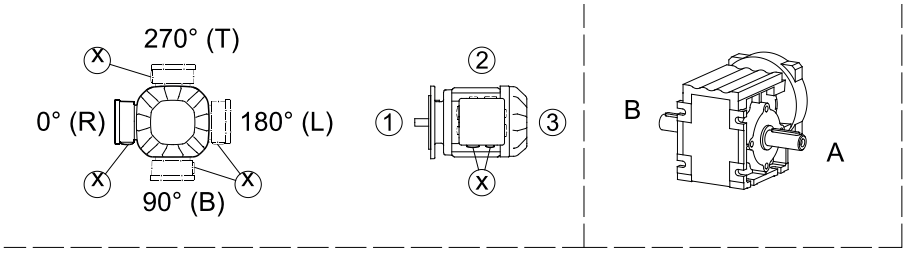
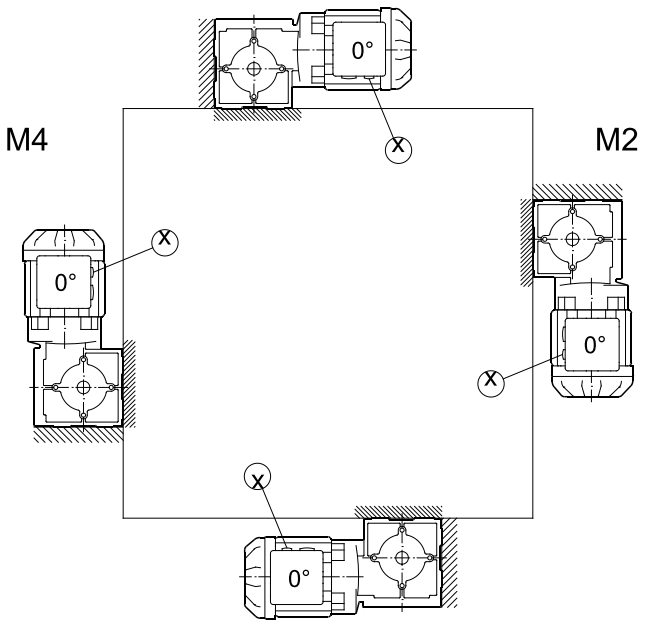
7.9.7 Mounting positions of SPIROPLAN® gear units

W10 – 30



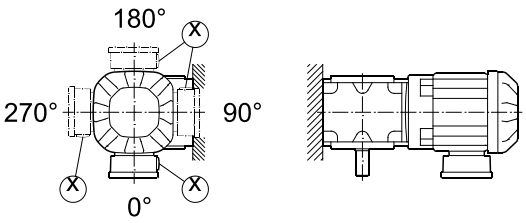
20 001 02 02

M1

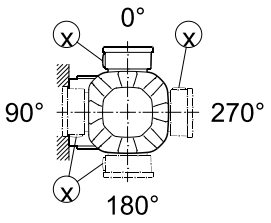


M3

M5



M6



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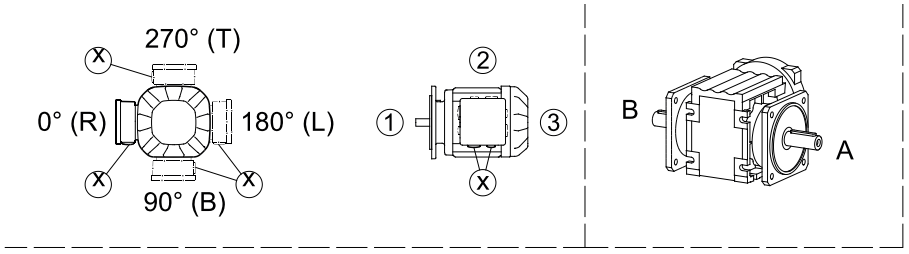
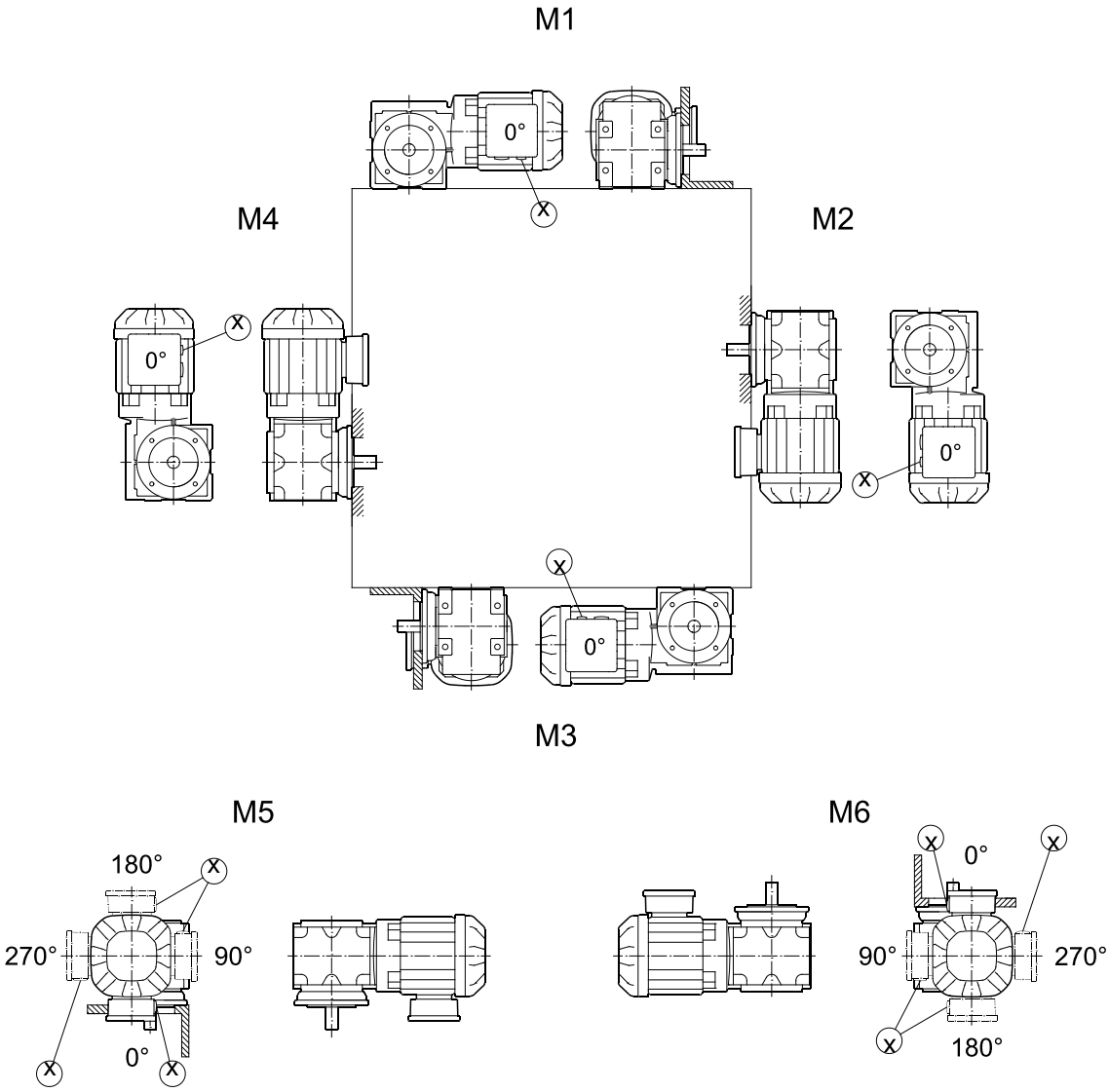
WF10 to 30

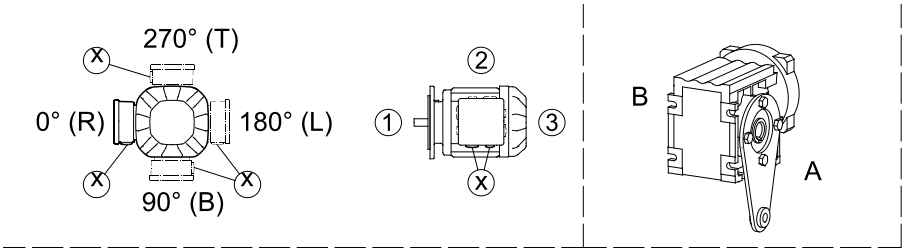
20 002 02 02

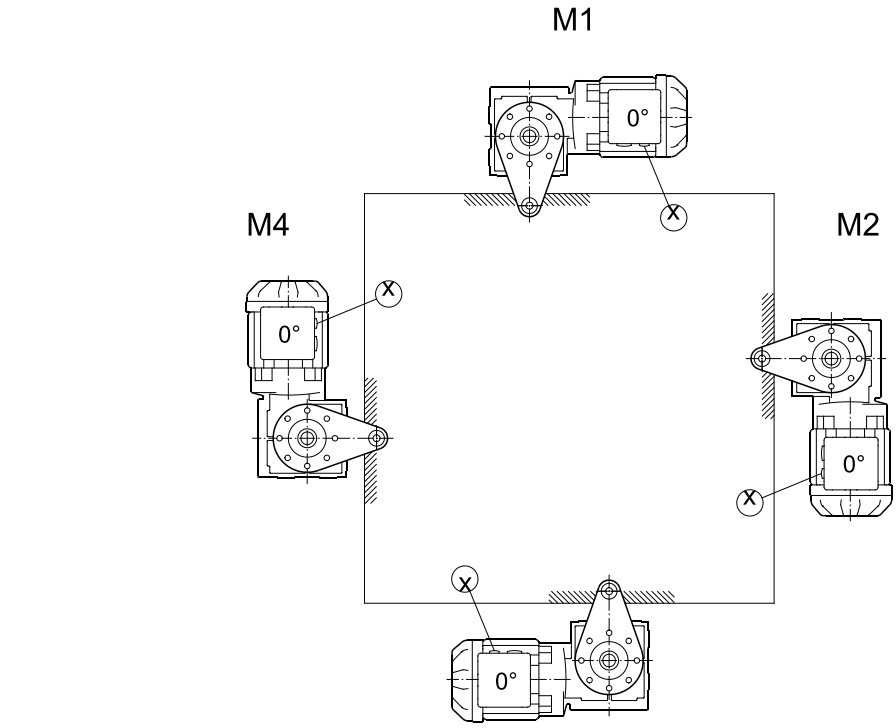


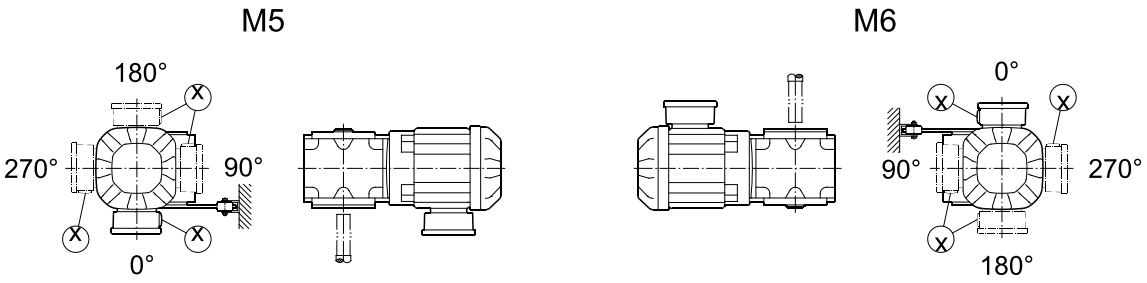


WA10 to 30

20 003 03 02







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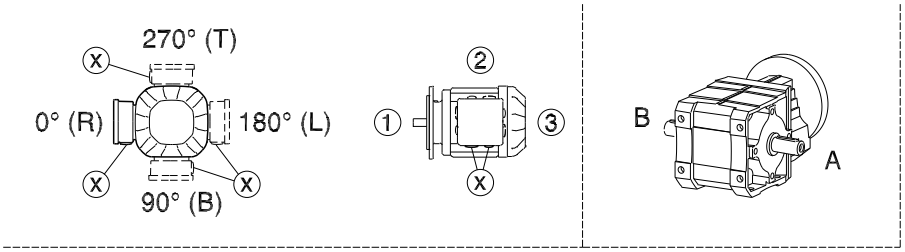
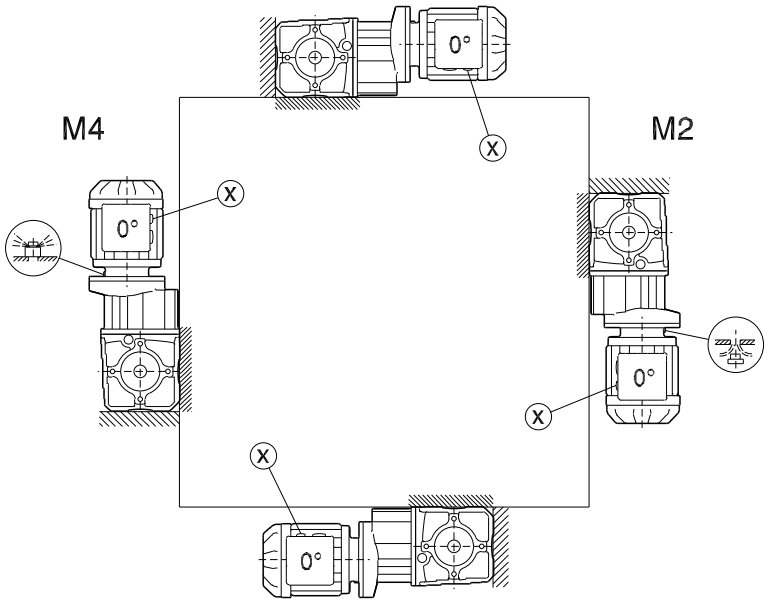
W/WA..B/WH37B to 47B



M1

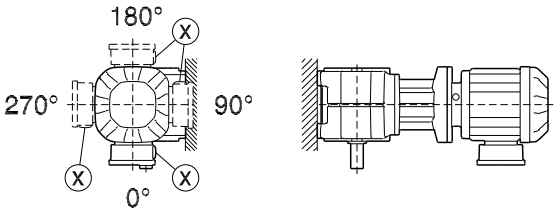


M4

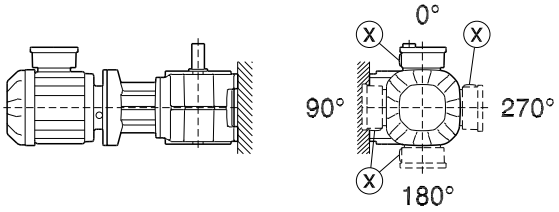
M2

M3

M5



M6



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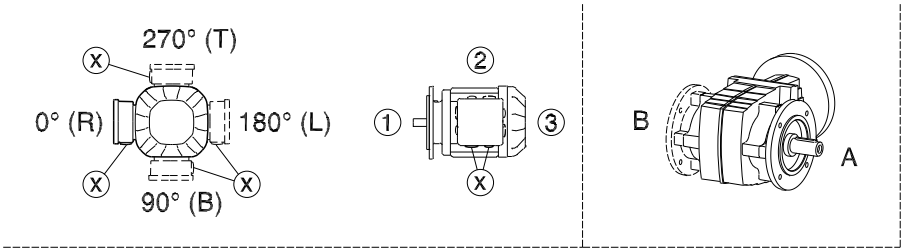
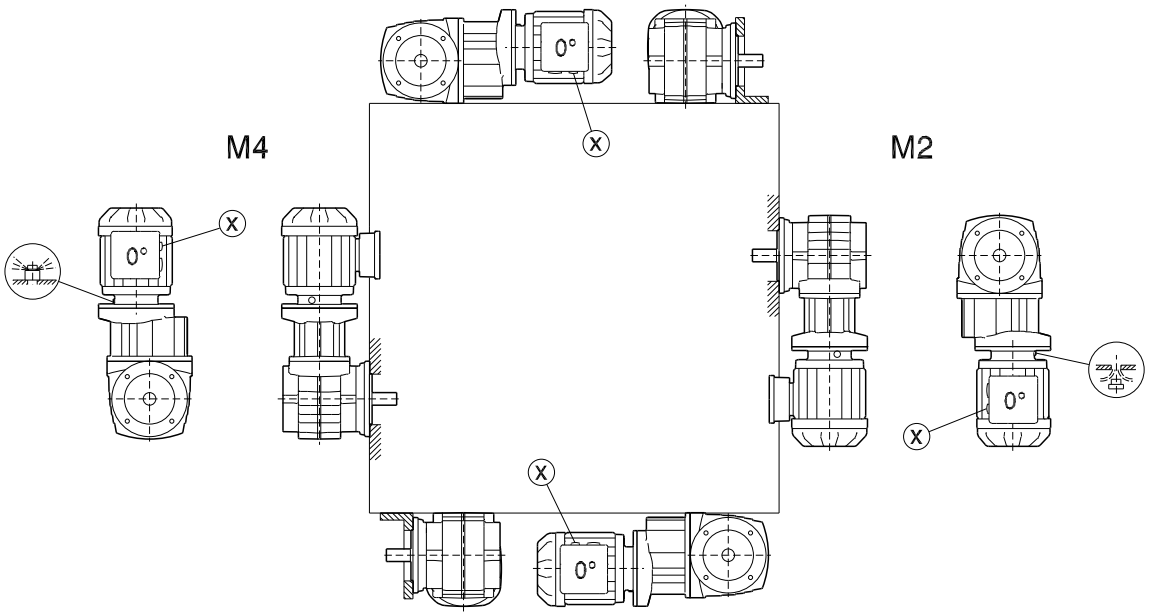
WF/WAF/WHF37 to 47

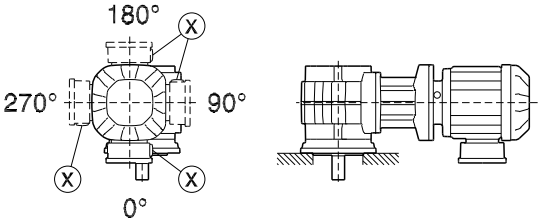


M1



M3

M5



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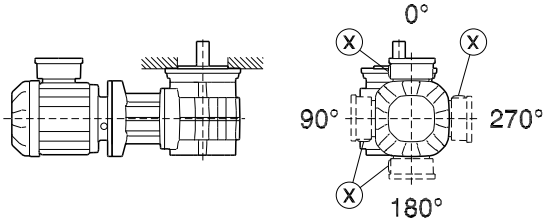

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WA/WH/WT37 to 47

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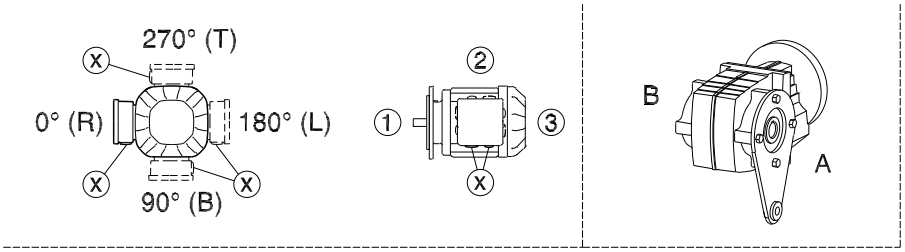

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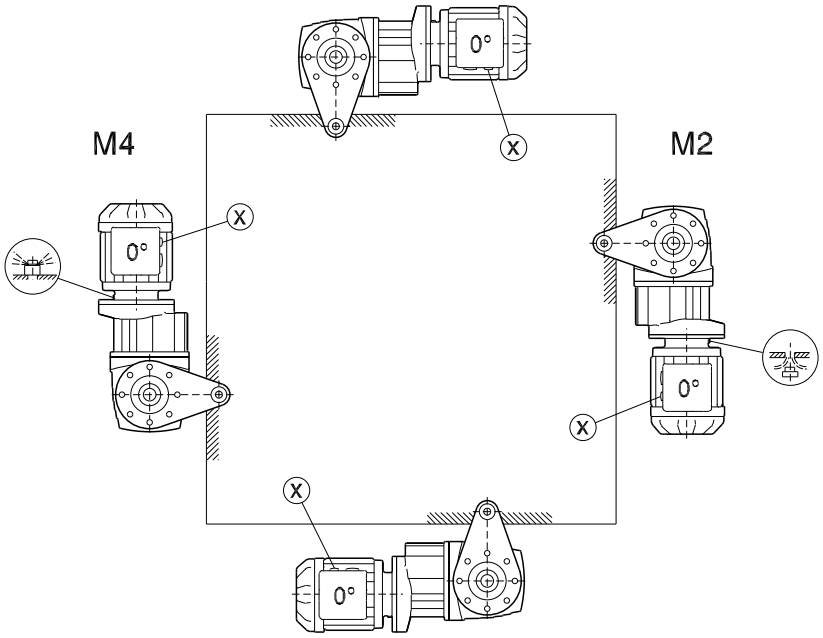

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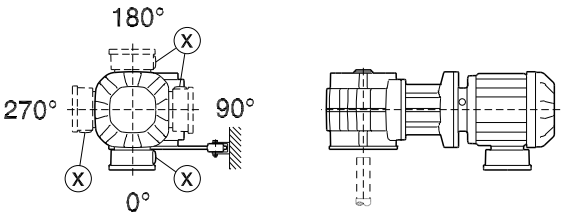

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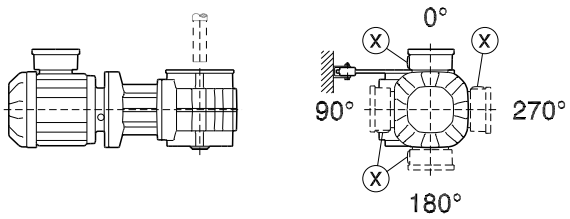

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WF/WAF19 – 59, WHF29 – 59

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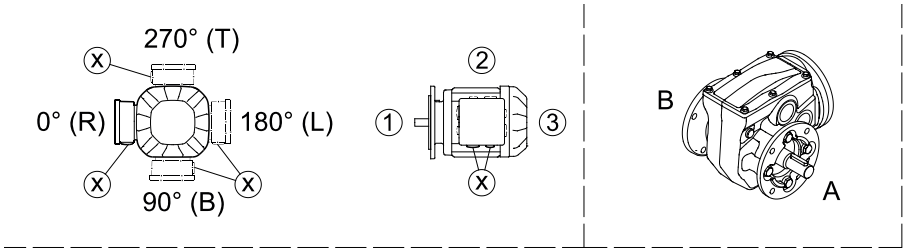

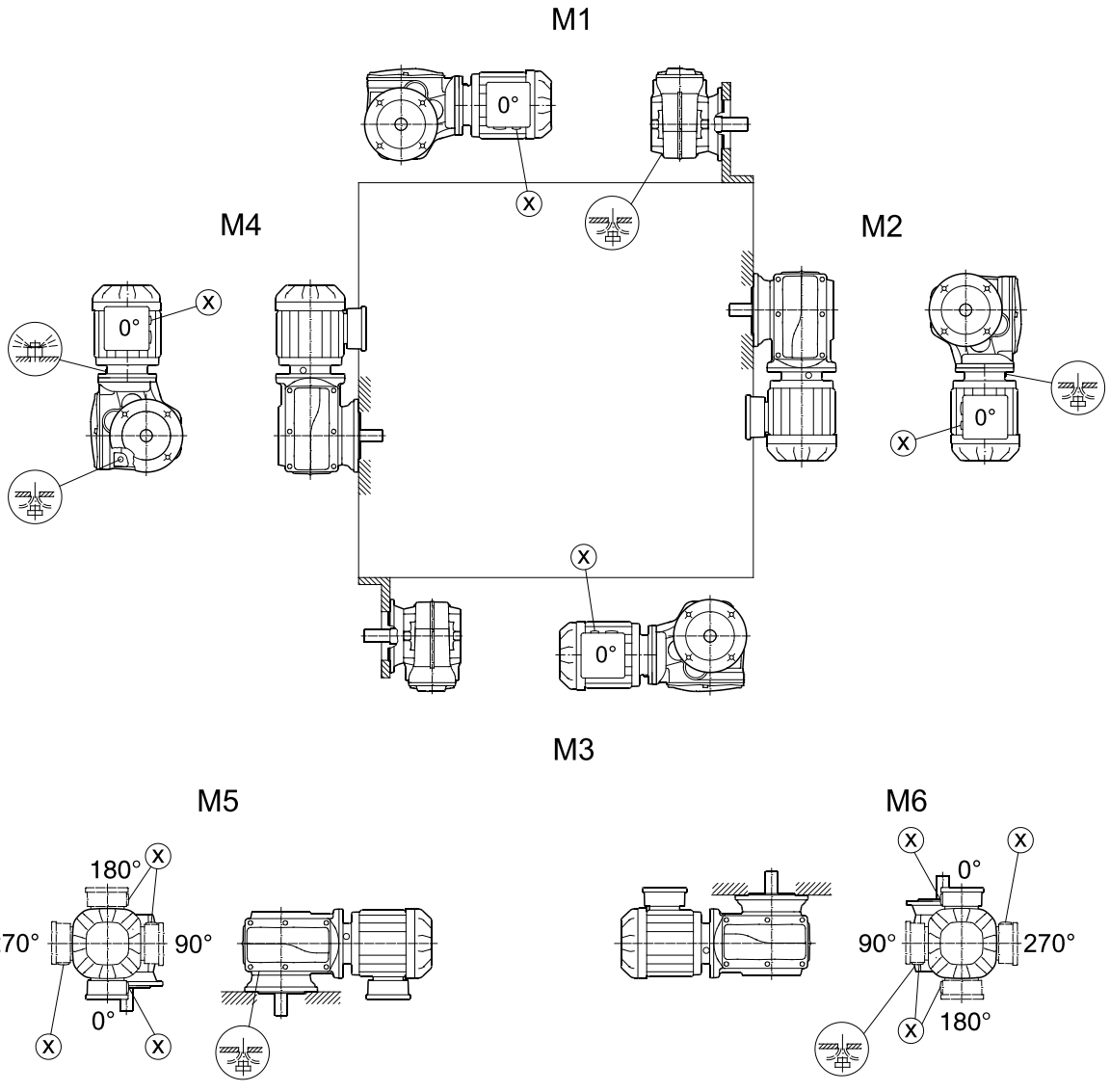

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WA19 – 59, WH/WT29 – 59

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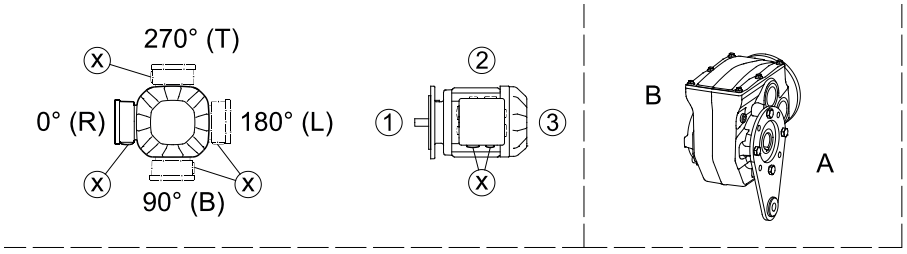

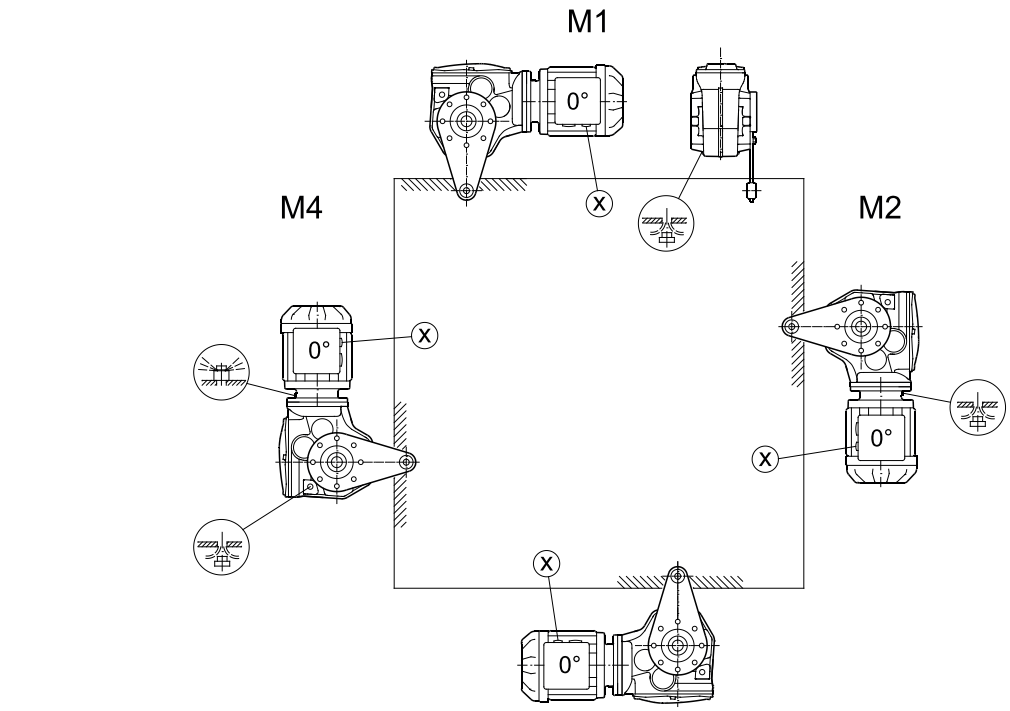

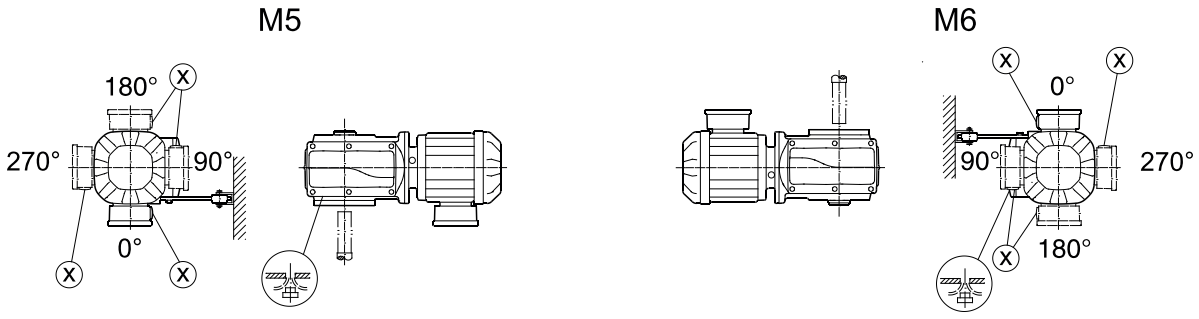

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8 Technical data

8.1 Extended storage

INFORMATION

For storage periods longer than 9 months, SEW-EURODRIVE recommends the "extended storage" gear unit type. Gear units in this design are designated with a corresponding label.

INFORMATION

The gear units must remain tightly sealed until taken into operation to prevent the VCI anti-corrosion agent from evaporating.

For gear units of the "extended storage" design, the following measures are taken:

- The lubricant is mixed with a VCI anti-corrosion agent (**v**olatile **c**orrosion **i**nhibitors).

  Bear in mind that this VCI anti-corrosion agent is only effective in a temperature range from -25 °C to +50 °C.
- The flange contact surfaces and shaft ends are also treated with an anti-corrosion agent.

8.1.1 Storage conditions for long-term storage

Observe the storage conditions specified in the following table for extended storage:

Climate zone	Packaging[1)]	Storage[2)]	Storage duration
Temperate (Europe, USA, Canada, China and Russia, excluding tropical zones)	• Packed in containers • With desiccant and moisture indicator sealed in the plastic wrap	• Roofed • Protected against rain and snow • and shocks	Up to 4 years with regular inspection of the packaging and humidity indicator (rel. humidity < 50%)
	Open	• Under roof and enclosed at constant temperature and atmospheric humidity (5 °C < ϑ < 50 °C, relative humidity < 50%) • No sudden temperature variations • Controlled ventilation with filter (free from dust and dirt) • No aggressive vapors • No shocks	2 years or more with regular inspections • Check for cleanness and mechanical damage during the inspection • Check corrosion protection

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Climate zone	Packaging[1)]	Storage[2)]	Storage duration
Tropical (Asia, Africa, Central and South America, Australia, New Zealand excluding temperate zones)	• Packed in containers • With desiccant and moisture indicator sealed in the plastic wrap • Protected against insect damage and mildew by chemical treatment	• Roofed • Protected against rain and snow • and shocks	Up to 3 years with regular inspection of the packaging and humidity indicator (rel. humidity < 50%)
	Open	• Under roof and enclosed at constant temperature and atmospheric humidity (5 °C < ϑ < 50 °C, relative humidity < 50%) • No sudden temperature variations • Controlled ventilation with filter (free from dust and dirt) • No aggressive vapors • No shocks • Protected against insect damage	2 years or more with regular inspections • Check for cleanness and mechanical damage during the inspection • Check corrosion protection

1) Packaging must be carried out by an experienced company using packaging material specifically suited for the application.

2) SEW-EURODRIVE recommends to store the gear units according to the mounting position.

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8.2 Lubricants

Unless a special arrangement is made, SEW-EURODRIVE supplies the drives with a lubricant fill adapted for the specific gear unit and mounting position. The mounting position (see chapter "Mounting positions" (→ 🗎 145)) must therefore be specified in the drive order. You must adapt the lubricant fill in case of any subsequent changes made to the mounting position (see chapter "Lubricant fill quantities" (→ 🗎 205)).

8.2.1 Bearing greases

The gear unit rolling bearings are given a factory-fill with the greases listed below. SEW-EURODRIVE recommends re-greasing the rolling bearings with a grease filling at the same time as changing the oil.

This table shows the lubricants recommended by SEW-EURODRIVE:

Operating range	Ambient temperature	Manufacturer	Type
Standard	-40 °C to +80 °C	SEW-EURODRIVE	Grease HL 2 E1[1)]
		Fuchs	Renolit CX-TOM 15[1)]
		Klüber	Petamo GHY 133 N
 2)	-40 °C to +40 °C	SEW-EURODRIVE	Grease HL 2 H1 E1
		Bremer & Leguil	Cassida Grease GTS 2
 3)	-20 °C to +40 °C	Fuchs	Plantogel 2S

1) Bearing grease based on semi-synthetic base oil.
2) Lubricant for the food processing industry.
3) Readily biodegradable lubricant for environmentally sensitive areas.

INFORMATION

The following grease quantities are required:

- **For fast-running bearings (gear unit input side):** Fill the cavities between the rolling elements one-third full with grease.
- **For slow-running bearings (gear unit output side):** Fill the cavities between the rolling elements two-thirds full with grease.

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8.2.2 Lubricant table

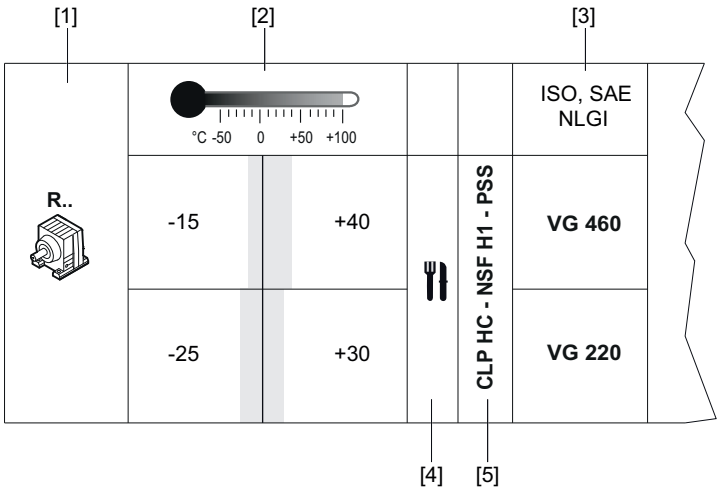
NOTICE

Damage to the gear unit due to improper lubricants.

Possible damage to property.

- The oil viscosity and type (mineral/synthetic) to be used are determined by SEW-EURODRIVE specifically for each order. This information is noted in the order confirmation and on the gear unit's nameplate. If you use other lubricants for the gear units and/or use the lubricants at temperatures outside the recommended temperature range, SEW-EURODRIVE does not assume liability.
- The lubricant recommendation in the lubricant table in no way represents a guarantee regarding the quality of the lubricant delivered by each respective supplier. Each lubricant manufacturer is responsible for the quality of their product.
- Do not mix synthetic lubricants.
- Do not mix synthetic lubricants and mineral lubricants.
- Oils of the same viscosity class from different manufacturers do not have the same characteristics. In particular, the minimally and maximally permitted oil bath temperatures are manufacturer-specific. These temperatures are specified in the lubricant tables.
- The values specified in the lubricant tables apply as of the time of printing of this document. The data of the lubricants is subject to dynamic change on the part of the lubricant manufacturers. For the latest information about the lubricants, visit: **www.sew-eurodrive.de/lubricants**.

Information on the table structure



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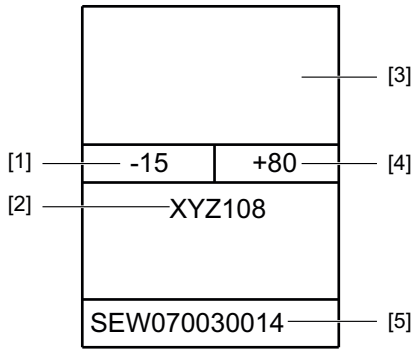
[1] Gear unit type
[2] Ambient temperature range
[3] Viscosity class
[4] Note on special approvals
[5] Lubricant type

The specified ambient temperatures are guide values for selecting a suitable lubricant. The exact upper and lower temperature limits for project planning are specified in the table with the respective trade name. Bear in mind during project planning that the viscosity increases at low temperatures and that this might influence the starting behavior.

Information on the various lubricants



[1] Lowest oil sump temperature in °C, **going below this value during operation is not permitted**
[2] Trade name
[3] Manufacturer
[4] Highest oil sump temperature in °C. The service life will be considerably reduced when this temperature is exceeded. Observe the lubricant change intervals according to chapter "Lubricant change intervals" (→ 🗎 127).
[5] Approvals regarding compatibility of the lubricant with approved oil seals

Lubricant compatibility with oil seals

Approval	Explanation
SEW07004_ _13:	A lubricant especially recommended with regard to compatibility with the approved oil seals. The lubricant exceeds the state-of-the-art requirements regarding elastomer compatibility.

Approved application temperature range of the oil seals

In the low temperature range, oil seals can withstand shaft deflections (e. g. through overhung load) only to a limited extent. Especially avoid or limit pulsating or changing radial displacements of the shaft. Contact SEW-EURODRIVE, if required.

Oil seal material class	Permitted oil sump temperature
NBR	-40 °C to +80 °C
FKM	-25 °C to +115 °C
FKM-PSS	-25 °C to +115 °C

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Limitations of use of oil seals with the specific lubricant are described in the following table:

Material class			Manufacturer		Material	
S	1	NBR	1	Freudenberg		72 NBR 902
			2	Trelleborg		4NV11
	2	FKM	1	Freudenberg	1	75 FKM 585
					2	75 FKM 170055
			2	Trelleborg	1	VCBVR
			3	SKF	1	FKM 00934

Examples:

S11: Only the elastomer 72NBR902 of the Freudenberg company meets the requirements of the approval in conjunction with the specific lubricant.

S2: Only the elastomer FKM meets the requirements of the approval in conjunction with the specific lubricant.

Key

The following table shows the abbreviations and symbols used in the lubricant table and explains what they mean:

Abbreviation/symbol	Meaning
	Synthetic lubricant (marked gray)
	Mineral lubricant
CLP	Mineral oil
CLP PG	Polyglycol (PG)
rPCF	reduced Product Carbon Footprint
CLP HC	Synthetic hydrocarbons to polyalphaolefins (PAO)
E	Ester-based oil
	Lubricant for the food processing industry and feed industry. Oils are NSF-H1 registered and compliant in accordance with FDA 21 CFR § 178.3570
	Lubricants with particularly reduced CO2 footprint (cradle-to-gate) with sustainable raw materials
	Lubricants with slight bio-degradability for environmentally sensitive areas (> 60% according to OECD 301 or according to appendix A of EPA 2013 VGP)
	Lubricant suitable for explosion-protected gear units and gearmotors
1)	Helical-worm gear units with CLP-PG: Contact SEW-EURODRIVE.
2)	Low-viscosity grease
3)	With appropriate measures, the gear units can be operated at ambient temperatures as low as -40 °C. Contact SEW-EURODRIVE.

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Abbreviation/symbol	Meaning
Oil seal	Oil seal
Premium Sine Seal	Oil seal of the Premium Sine Seal type. The addendum "PSS" for the lubricant type indicates compatibility with the sealing system.

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Lubricant table for R.., F.., and K..7 gear units

The lubricant table is valid on the day this document is published. Refer to **www.sew-eurodrive.de/lubricants** for the latest tables.

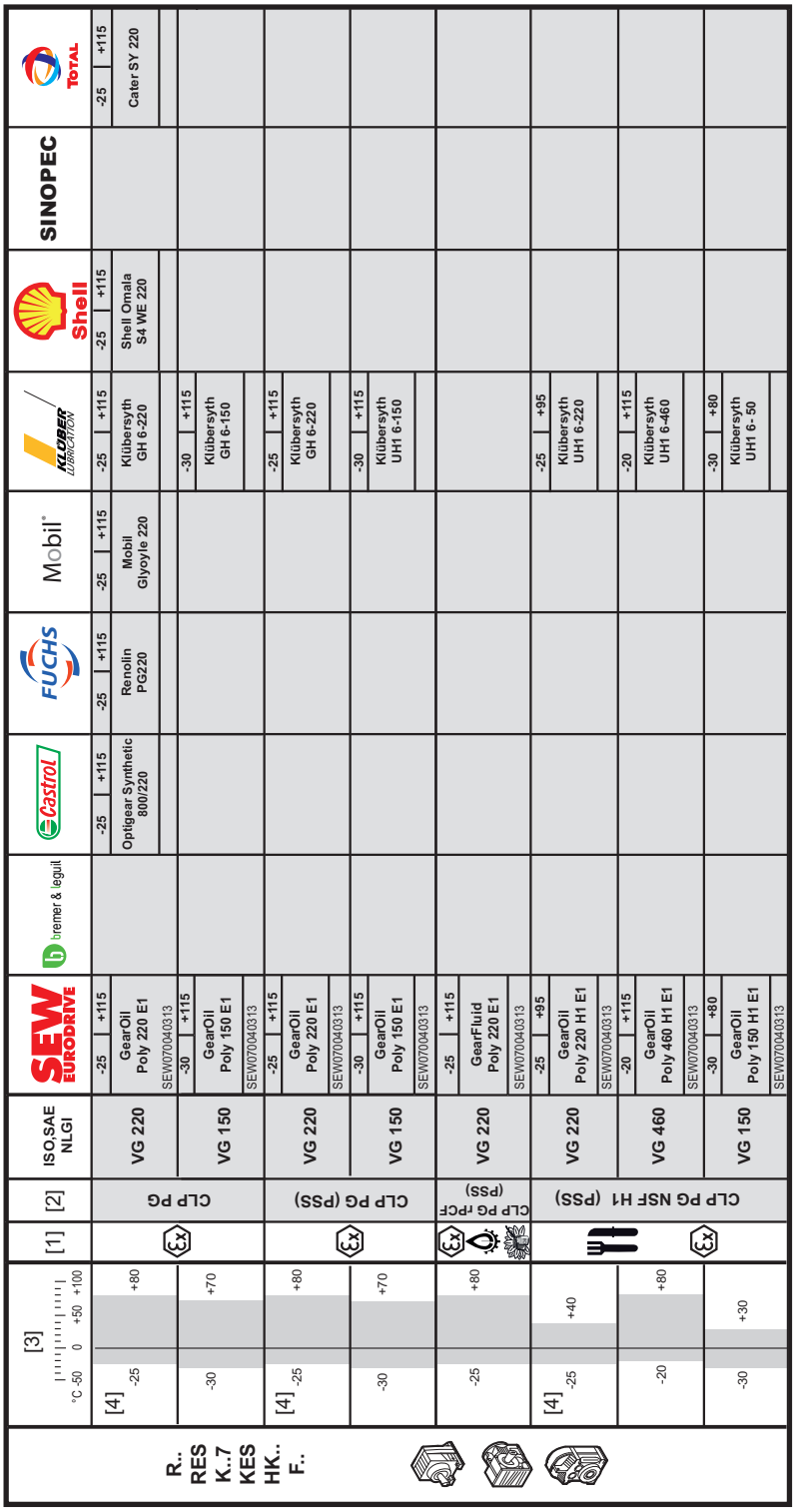
Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seals" (→ 🗎 190).

R.. RES K..7 KES HK.. F..	[3] °C -50 0 +50 +100	[1]	[2]	ISO,SAE NLGI	SEW EURODRIVE	bremer & leguil	Castrol	FUCHS	Mobil	KLÜBER LUBRICATION	Shell	SINOPEC	TOTAL
[4] -15	+40		CLP	VG 220	-15 | +80 GearOil Base 220 E1/US1/CN1/BR1 SEW07004031		-15 | +80 Optigear BM 220 SEW07004031	-15 | +80 Renolin CLP 220 Plus SEW07004031	-15 | +80 Mobilgear 600 XP 220 SEW07004001	-15 | +80 Klüberoil GEM 1-220 N	-15 | +80 Shell Omala SG 220	-15 | +80 AP-SGO 220 SEW07004031	-15 | +80 Cater EP 220
-20	+30			VG 150	-20 | +80 GearOil Base 150 E1/US1/CN1/BR1 SEW07004031		-20 | +80 Optigear BM 150 SEW07004031	-20 | +80 Renolin CLP150 Plus SEW07004031	-20 | +80 Mobilgear 600 XP 150 SEW07004001	-20 | +80 Klüberoil GEM 1-150 N SEW07004031	-20 | +80 Shell Omala SG 150 SEW07004031	-20 | +80 AP-SGO 150 SEW07004031	-20 | +80 Cater EP 150 SEW07004031
[4] -15	+40		CLP PSS	VG 220	-15 | +80 GearOil Base 220 E1/US1/CN1/BR1 SEW07004031			-15 | +80 Renolin CLP 220 Plus SEW07004031	-15 | +80 Mobilgear 600 XP 220 SEW07004001			-15 | +80 AP-SGO 220 SEW07004031	
-20	+30			VG 150	-20 | +80 GearOil Base 150 E1/US1/CN1/BR1 SEW07004031			-20 | +80 Renolin CLP150 Plus SEW07004031	-20 | +80 Mobilgear 600 XP 150 SEW07004001			-20 | +80 AP-SGO 150 SEW07004031	

[1] Note on special approvals
[2] Oil type
[3] Ambient temperature range
[4] Standard

The lubricant table is valid on the day this document is published. Refer to **www.sew-eurodrive.de/lubricants** for the latest tables.

Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seals" (→ 190).



R.. RES K..7 KES HK.. F..	[3] °C -50 0 +50 +100	[1]	[2]	ISO,SAE NLGI	SEW EURODRIVE	lubrimer & legull	Castrol	FUCHS	Mobil	KLÜBER LUBRICATION	Shell	SINOPEC	TOTAL
	[4] -25		CLP PG	VG 220	-25 | +115 GearOil Poly 220 E1 SEW07004031 3		-25 | +115 Optigear Synthetic 800/220	-25 | +115 Renolin PG220	-25 | +115 Mobil Glyoyle 220	-25 | +115 Klübersyth GH 6-220	-25 | +115 Shell Omala S4 WE 220		-25 | +115 Cater SY 220
	-30			VG 150	-30 | +115 GearOil Poly 150 E1 SEW07004031 3					-30 | +115 Klübersyth GH 6-150			
	[4] -25		CLP PG (PSS)	VG 220	-25 | +115 GearOil Poly 220 E1 SEW07004031 3					-25 | +115 Klübersyth GH 6-220			
	-30			VG 150	-30 | +115 GearOil Poly 150 E1 SEW07004031 3					-30 | +115 Klübersyth UH1 6-150			
	-25		CLP PG rPCF (PSS)	VG 220	-25 | +115 GearFluid Poly 220 E1 SEW07004031 3								
	[4] -25		CLP PG NSF H1 (PSS)	VG 220	-25 | +95 GearOil Poly 220 H1 E1 SEW07004031 3					-25 | +95 Klübersyth UH1 6-220			
	-20			VG 460	-20 | +115 GearOil Poly 460 H1 E1 SEW07004031 3					-20 | +115 Klübersyth UH1 6-460			
	-30			VG 150	-30 | +80 GearOil Poly 150 H1 E1 SEW07004031 3					-30 | +80 Klübersyth UH1 6- 50			

[1] Note on special approvals
[2] Oil type
[3] Ambient temperature range
[4] Standard

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The lubricant table is valid on the day this document is published. Refer to **www.sew-eurodrive.de/lubricants** for the latest tables.

Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seals" (→ 190).

R.., RES, K..7, KES, HK.., F..	[3] °C -50 0 +50 +100	[1]	[2]	ISO,SAE NLGI	SEW EURODRIVE	bremer & leguil	Castrol	FUCHS	Mobil	KLÜBER LUBRICATION	Shell	SINOPEC	TOTAL
	[4] -25 / +60	Ex	CLP HC	3) VG 220	-30 | +110 GearOil Synth 220 E1/US1 SEW070040313			-25 | +110 Renolin Unisyn CLP220	-25 | +110 Mobil SHC 630	-25 | +110 Klübersynth GEM 4-220 N	-25 | +110 Shell Omala S4 GX 220		-25 | +110 Cater SH 220
	[4] -30 / +50	Ex	CLP HC	3) VG 150	-35 | +105 GearOil Synth 150 E1/US1 SEW070040313			-30 | +95 Renolin Unisyn CLP150	-30 | +100 Mobil SHC 629	-30 | +100 Klübersynth GEM 4-150 N	-30 | +100 Shell Omala S4 GX 150		-30 | +95 Cater SH 150
	[4] -35 / +20	Ex	CLP HC	VG 68	SEW070040313			-35 | +75 Renolin Unisyn CLP68	-40 | +75 Mobil SHC 626		-40 | +75 Shell Omala S4 GX 68		
	[4] -40 / 0	Ex	CLP HC	VG 32	-40 | +50 GearOil Synth 220 E1/US1 SEW070040313			-40 | +50 Renolin Unisyn OL32	-40 | +50 Mobil SHC 624				-40 | +50 Dacnis SH 32
	[4] -25 / +60	Ex	CLP HC (PSS)	3) VG 220	-30 | +110 GearOil Synth 220 E1/US1 SEW070040313				-25 | +110 Mobil SHC 630				
	[4] -30 / +50	Ex	CLP HC (PSS)	3) VG 150	-35 | +105 GearOil Synth 150 E1/US1 SEW070040313				-30 | +100 Mobil SHC 629				

[1] Note on special approvals
[2] Oil type
[3] Ambient temperature range
[4] Standard

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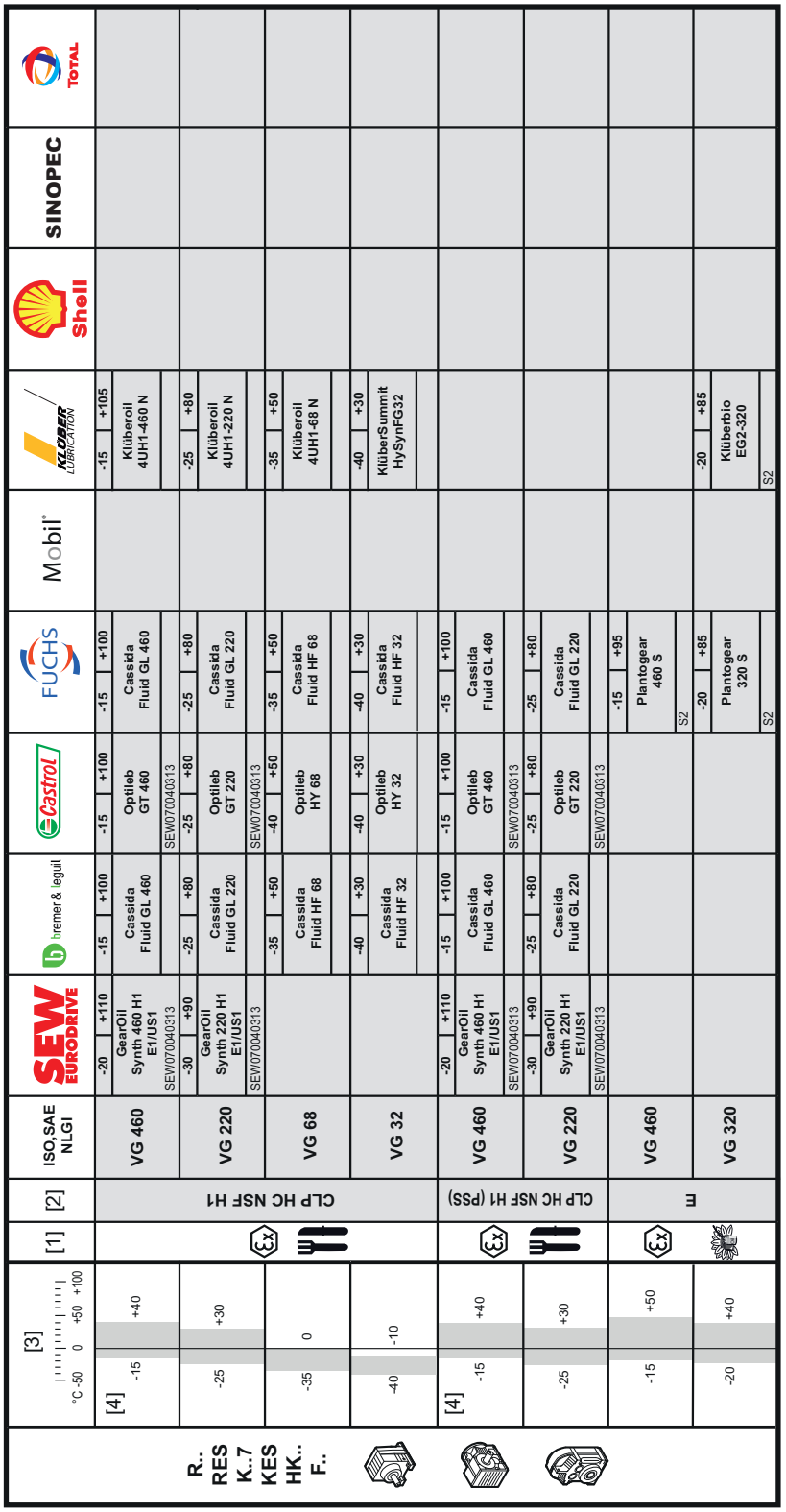
The lubricant table is valid on the day this document is published. Refer to **www.sew-eurodrive.de/lubricants** for the latest tables.

Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seals" (→ 190).



R.. RES K..7 KES HK.. F..	[4]	[3] °C -50 0 +50 +100	[1]	[2]	ISO,SAE NLGI	SEW EURODRIVE	bremer & leguil	Castrol	FUCHS	Mobil	KLÜBER LUBRICATION	Shell	SINOPEC	TOTAL
	-15	+40		CLP HC NSF H1	VG 460	-20 | +110 GearOil Synth 460 H1 E1/US1 SEW07004031 3	-15 | +100 Cassida Fluid GL 460	-15 | +100 Optileb GT 460 SEW07004031 3	-15 | +100 Cassida Fluid GL 460		-15 | +105 Klüberoil 4UH1-460 N			
	-25	+30			VG 220	-30 | +90 GearOil Synth 220 H1 E1/US1 SEW07004031 3	-25 | +80 Cassida Fluid GL 220	-25 | +80 Optileb GT 220 SEW07004031 3	-25 | +80 Cassida Fluid GL 220		-25 | +80 Klüberoil 4UH1-220 N			
	-35	0			VG 68	SEW07004031 3	-35 | +50 Cassida Fluid HF 68	-40 | +50 Optileb HY 68	-35 | +50 Cassida Fluid HF 68		-35 | +50 Klüberoil 4UH1-68 N			
	-40	-10			VG 32		-40 | +30 Cassida Fluid HF 32	-40 | +30 Optileb HY 32	-40 | +30 Cassida Fluid HF 32		-40 | +30 KlüberSummit HySynFG32			
	-15	+40		CLP HC NSF H1 (PSS)	VG 460	-20 | +110 GearOil Synth 460 H1 E1/US1 SEW07004031 3	-15 | +100 Cassida Fluid GL 460	-15 | +100 Optileb GT 460 SEW07004031 3	-15 | +100 Cassida Fluid GL 460					
	-25	+30			VG 220	-30 | +90 GearOil Synth 220 H1 E1/US1 SEW07004031 3	-25 | +80 Cassida Fluid GL 220	-25 | +80 Optileb GT 220 SEW07004031 3	-25 | +80 Cassida Fluid GL 220					
	-15	+50		E	VG 460	SEW07004031 3			-15 | +95 Plantogear 460 S S2					
	-20	+40			VG 320				-20 | +85 Plantogear 320 S S2		-20 | +85 Klüberbio EG2-320 S2			

[1] Note on special approvals
[2] Oil type
[3] Ambient temperature range
[4] Standard

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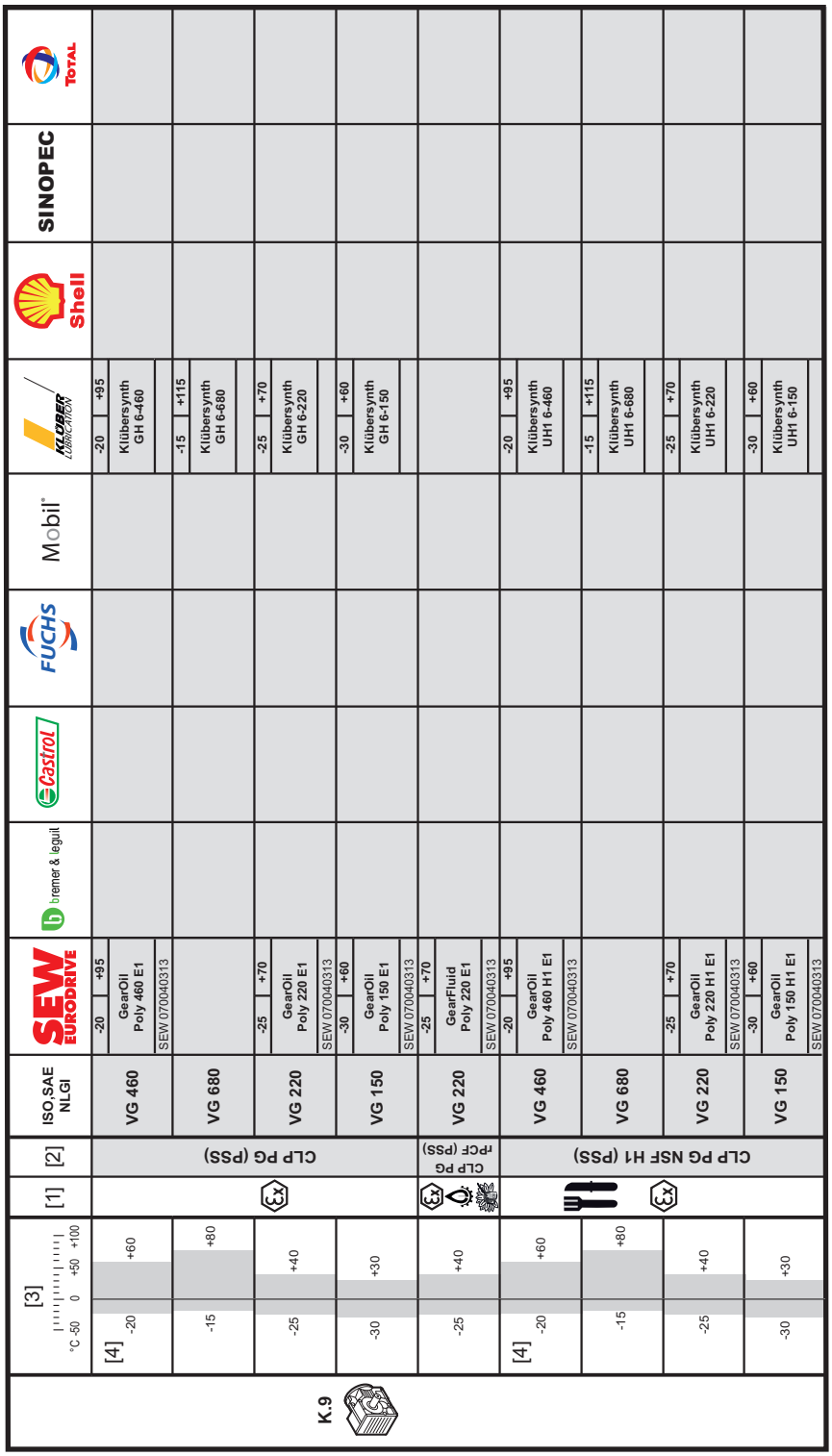
Lubricant table for K..9 gear units

The lubricant table is valid on the day this document is published. Refer to **www.sew-eurodrive.de/lubricants** for the latest tables.

Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seals" (→ 🗎 190).

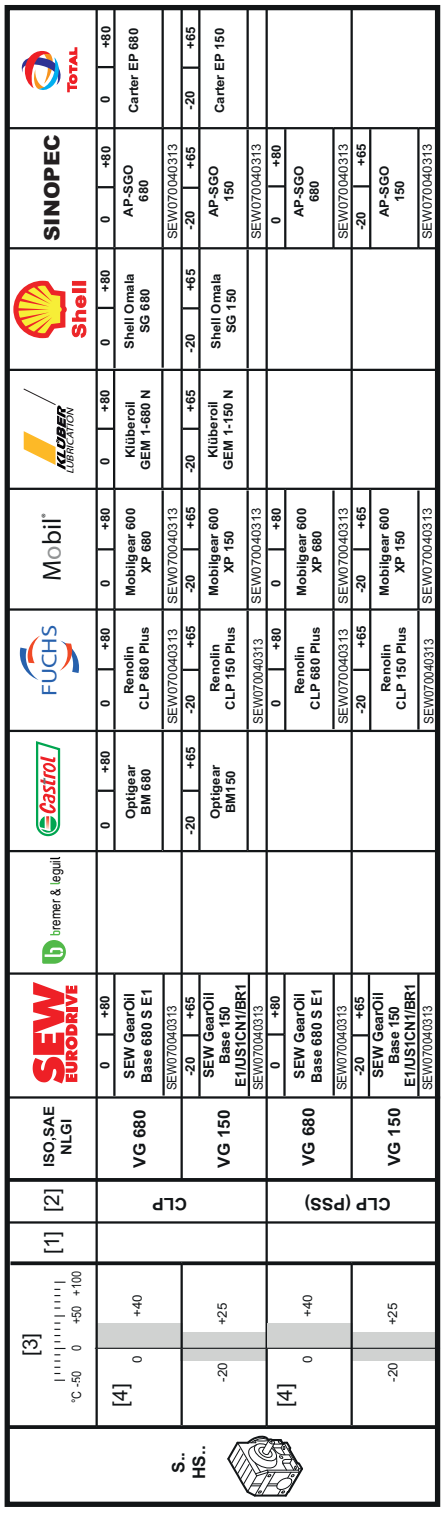


[1] Note on special approvals
[2] Oil type
[3] Ambient temperature range
[4] Standard

Lubricant table for S.. gear units

The lubricant table is valid on the day this document is published. Refer to **www.sew-eurodrive.de/lubricants** for the latest tables.

Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seals" (→ 🗎 190).



S.. HS..	[3] °C -50 0 +50 +100	[1]	[2]	ISO,SAE NLGI	SEW EURODRIVE	bremer & leguil	Castrol	FUCHS	Mobil	KLÜBER LUBRICATION	Shell	SINOPEC	TOTAL
	[4] 0 +40		CLP	VG 680	0 +80 SEW GearOil Base 680 S E1		0 +80 Optigear BM 680	0 +80 Renolin CLP 680 Plus	0 +80 Mobilgear 600 XP 680	0 +80 Klüberoil GEM 1-680 N	0 +80 Shell Omala SG 680	0 +80 AP-SGO 680	0 +80 Carter EP 680
					SEW07004031 3			SEW07004031 3	SEW07004031 3			SEW07004031 3	
	-20 +25			VG 150	-20 +65 SEW GearOil Base 150 E1/US1CN1/BR1		-20 +65 Optigear BM150	-20 +65 Renolin CLP 150 Plus	-20 +65 Mobilgear 600 XP 150	-20 +65 Klüberoil GEM 1-150 N	-20 +65 Shell Omala SG 150	-20 +65 AP-SGO 150	-20 +65 Carter EP 150
					SEW07004031 3			SEW07004031 3	SEW07004031 3			SEW07004031 3	
	[4] 0 +40		CLP (PSS)	VG 680	0 +80 SEW GearOil Base 680 S E1			0 +80 Renolin CLP 680 Plus	0 +80 Mobilgear 600 XP 680			0 +80 AP-SGO 680	
					SEW07004031 3			SEW07004031 3	SEW07004031 3			SEW07004031 3	
	-20 +25			VG 150	-20 +65 SEW GearOil Base 150 E1/US1CN1/BR1			-20 +65 Renolin CLP 150 Plus	-20 +65 Mobilgear 600 XP 150			-20 +65 AP-SGO 150	
					SEW07004031 3			SEW07004031 3	SEW07004031 3			SEW07004031 3	

[1] Note on special approvals
[2] Oil type
[3] Ambient temperature range
[4] Standard

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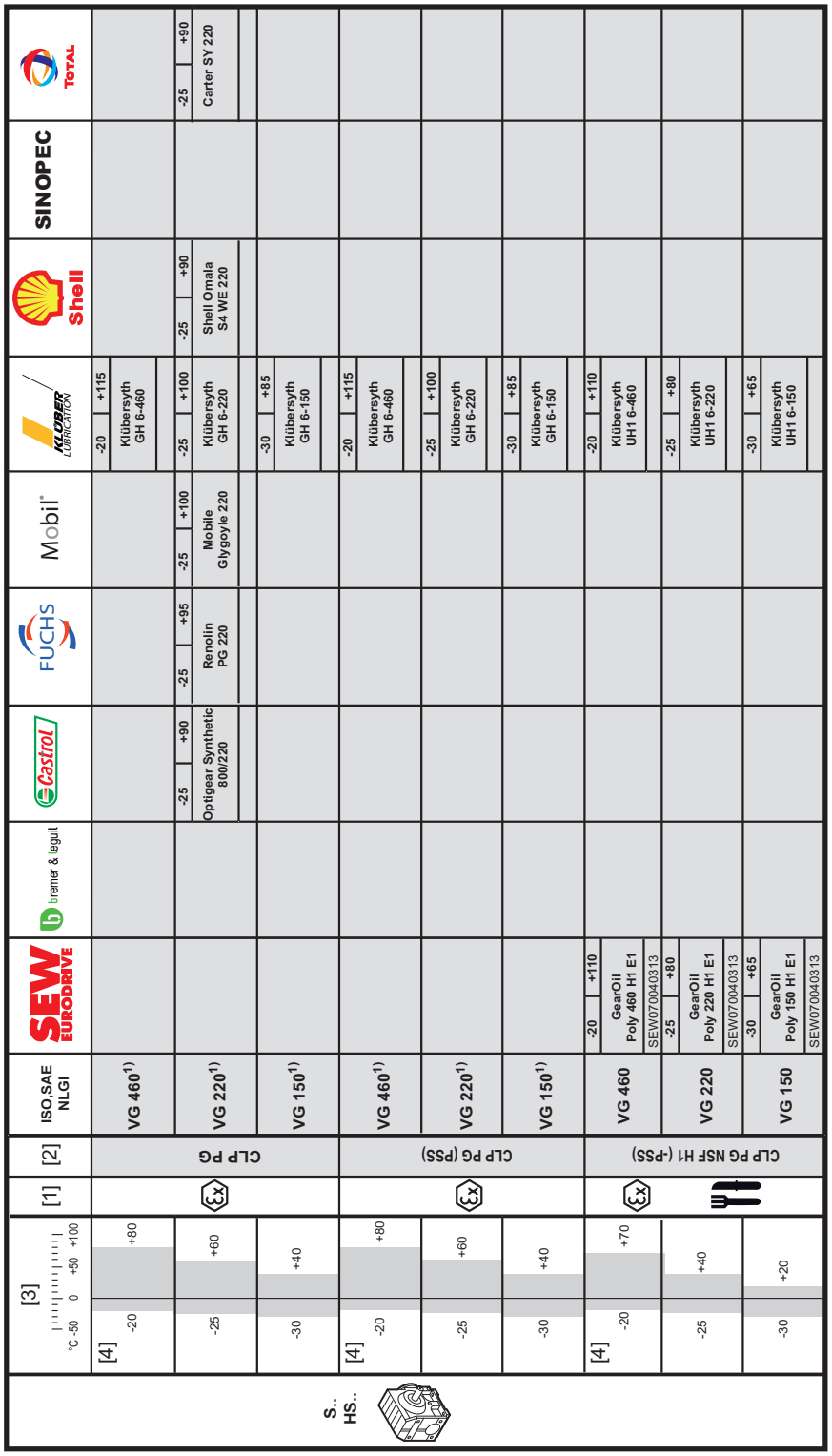
The lubricant table is valid on the day this document is published. Refer to **www.sew-eurodrive.de/lubricants** for the latest tables.

Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seals" (→ 🖹 190).



S.. HS..	[3] °C -50 0 +50 +100	[1]	[2]	ISO,SAE NLGI	SEW EURODRIVE	bremer & leguil	Castrol	FUCHS	Mobil	KLÜBER LUBRICATION	Shell	SINOPEC	TOTAL
	[4] -20 +80		CLP PG	VG 460[1]	-20 +110 GearOil Poly 460 H1 E1 SEW07004031 3		-25 +90 Optigear Synthetic 800/220	-25 +95 Renolin PG 220	-25 +100 Mobile Glygoyle 220	-20 +115 Klübersyth GH 6-460	-25 +90 Shell Omala S4 WE 220		-25 +90 Carter SY 220
	[4] -25 +60			VG 220[1]	-25 +80 GearOil Poly 220 H1 E1 SEW07004031 3					-25 +100 Klübersyth GH 6-220			
	[4] -30 +40			VG 150[1]	-30 +65 GearOil Poly 150 H1 E1 SEW07004031 3					-30 +85 Klübersyth GH 6-150			
	[4] -20 +80		CLP PG (PSS)	VG 460[1]						-20 +115 Klübersyth GH 6-460			
	[4] -25 +60			VG 220[1]						-25 +100 Klübersyth GH 6-220			
	[4] -30 +40			VG 150[1]						-30 +85 Klübersyth GH 6-150			
	[4] -20 +70		CLP PG NSF H1 (-PSS)	VG 460	-20 +110 GearOil Poly 460 H1 E1 SEW07004031 3					-20 +110 Klübersyth UH1 6-460			
	[4] -25 +40			VG 220	-25 +80 GearOil Poly 220 H1 E1 SEW07004031 3					-25 +80 Klübersyth UH1 6-220			
	[4] -30 +20			VG 150	-30 +65 GearOil Poly 150 H1 E1 SEW07004031 3					-30 +65 Klübersyth UH1 6-150			

[1] Note on special approvals
[2] Oil type
[3] Ambient temperature range
[4] Standard

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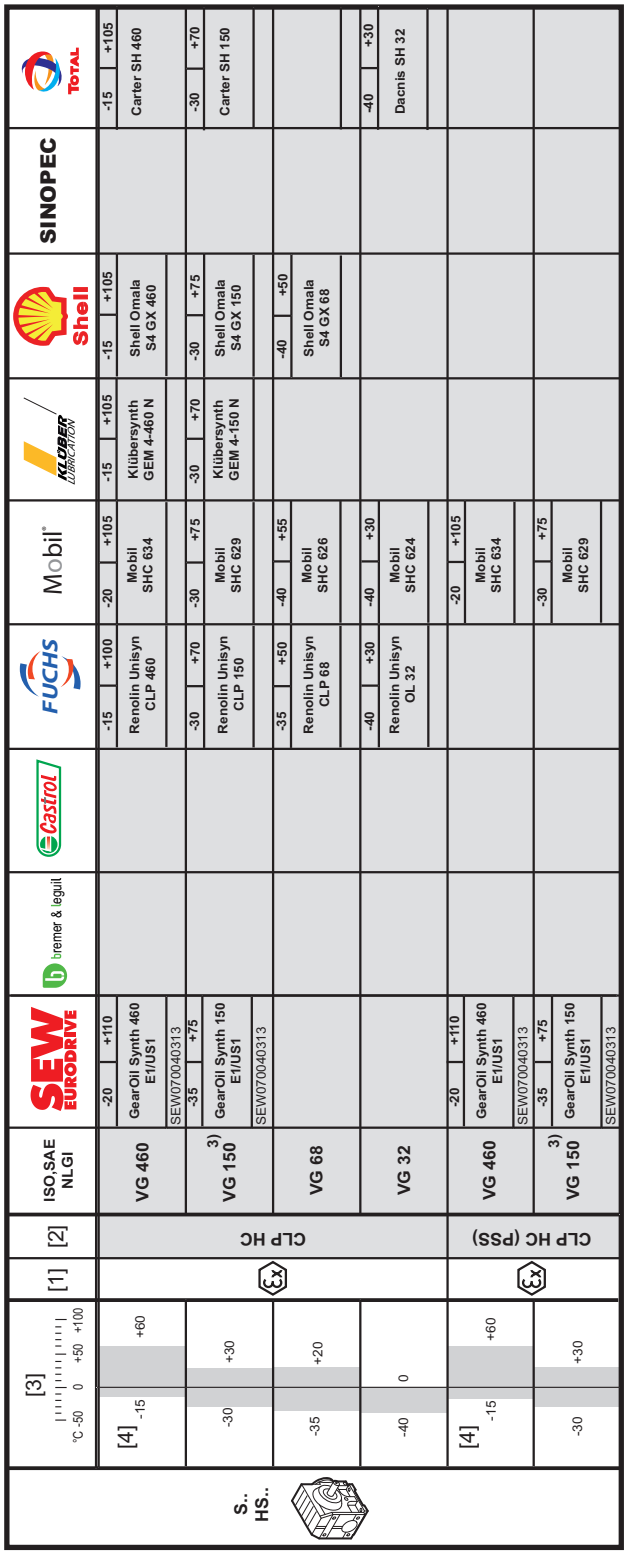
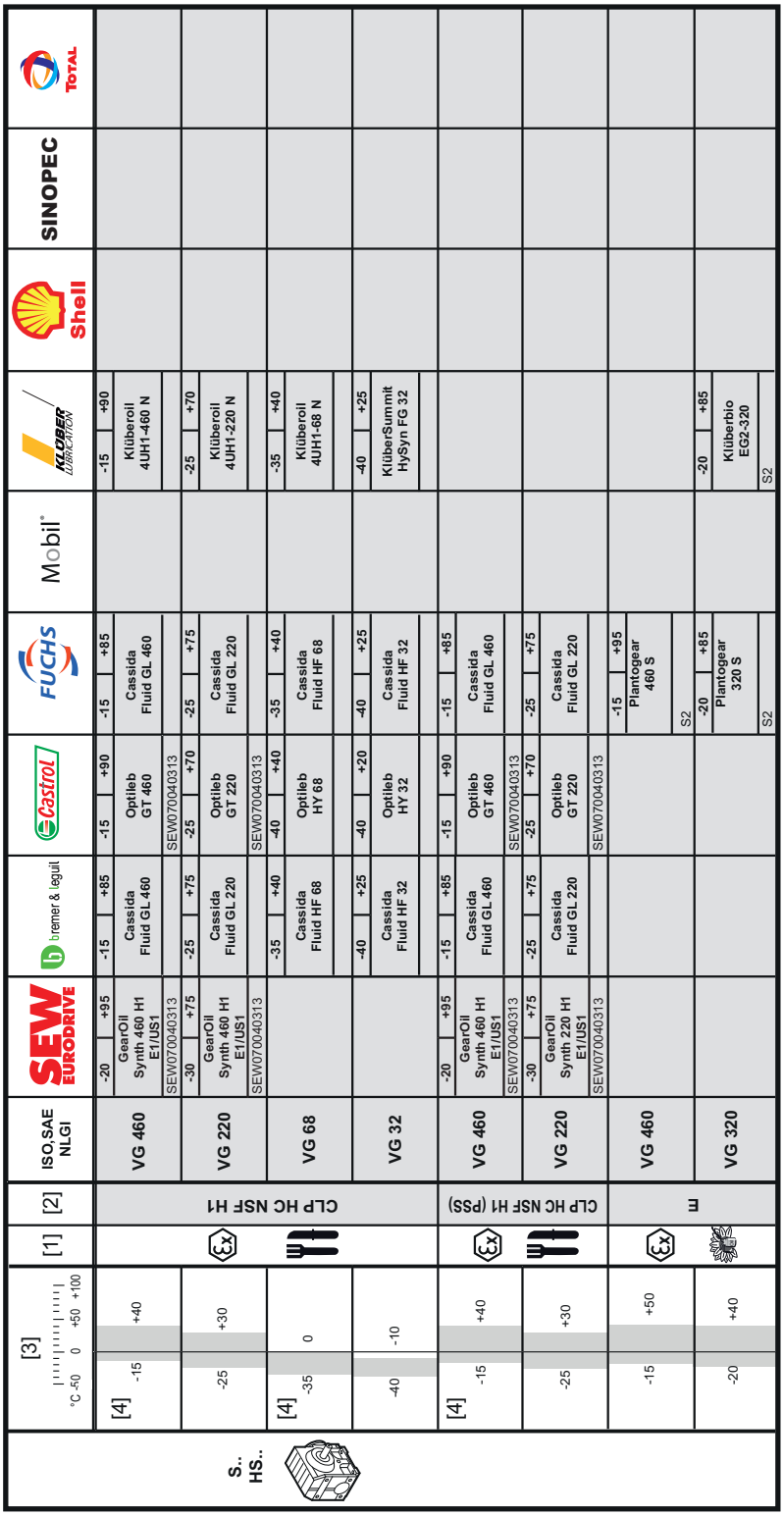
Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seals" (→ 🖹 190).



[1] Note on special approvals
[2] Oil type
[3] Ambient temperature range
[4] Standard

The lubricant table is valid on the day this document is published. Refer to **www.sew-eurodrive.de/lubricants** for the latest tables.

Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seals" (→ 🖹 190).



S.. HS..	[3] °C -40 0 +50 +100	[1]	[2]	ISO,SAE NLGI	SEW EURODRIVE	bremer & leguil	Castrol	FUCHS	Mobil	KLÜBER LUBRICATION	Shell	SINOPEC	TOTAL
	[4] -15 +40		CLP HC NSF H1	VG 460	-20 | +95 GearOil Synth 460 H1 E1/US1 SEW07004031	-15 | +85 Cassida Fluid GL 460	-15 | +90 Optileb GT 460	-15 | +85 Cassida Fluid GL 460		-15 | +90 Klüberoil 4UH1-460 N			
	-25 +30			VG 220	-30 | +75 GearOil Synth 460 H1 E1/US1 SEW07004031	-25 | +75 Cassida Fluid GL 220	-25 | +70 Optileb GT 220 SEW07004031	-25 | +75 Cassida Fluid GL 220		-25 | +70 Klüberoil 4UH1-220 N			
	[4] -35 0			VG 68	GearOil Synth 460 H1 E1/US1 SEW07004031	-35 | +40 Cassida Fluid HF 68	-40 | +40 Optileb HY 68	-35 | +40 Cassida Fluid HF 68		-35 | +40 Klüberoil 4UH1-68 N			
	-40 -10			VG 32		-40 | +25 Cassida Fluid HF 32	-40 | +20 Optileb HY 32	-40 | +25 Cassida Fluid HF 32		-40 | +25 KlüberSummit HySyn FG 32			
	[4] -15 +40		CLP HC NSF H1 (PSS)	VG 460	-20 | +95 GearOil Synth 460 H1 E1/US1 SEW07004031	-15 | +85 Cassida Fluid GL 460	-15 | +90 Optileb GT 460 SEW07004031	-15 | +85 Cassida Fluid GL 460					
	-25 +30			VG 220	-30 | +75 GearOil Synth 220 H1 E1/US1 SEW07004031	-25 | +75 Cassida Fluid GL 220	-25 | +70 Optileb GT 220 SEW07004031	-25 | +75 Cassida Fluid GL 220					
	-15 +50		E	VG 460				-15 | +95 Plantogear 460 S S2					
	-20 +40			VG 320				-20 | +85 Plantogear 320 S S2		-20 | +85 Klüberbio EG2-320 S2			

[1] Note on special approvals
[2] Oil type
[3] Ambient temperature range
[4] Standard

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Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seals" (→ 🖹 190).

S.7p	[3] °C -50 0 +50 +100	[1]	[2]	ISO, SAE NLGI	SEW EURODRIVE	bremer & leguil	Castrol	FUCHS	Mobil	KLÜBER LUBRICATION	Shell	SINOPEC	TOTAL
[4] -20	+80	Ex	CLP PG (PSS)	VG 460 [1]	-20 | +115 GearOil Poly 460 E1 SEW07004031 3								
-25	+60	Ex	CLP PG (PSS)	VG 220 [1]	-25 | +100 GearOil Poly 220 E1 SEW07004031 3								
-30	+40	Ex	CLP PG (PSS)	VG 150 [1]	-30 | +85 GearOil Poly 150 E1 SEW07004031 3								
-25	+60	Ex	CLP PG rPCF (PSS)	VG 220	-25 | +100 GearFluid Poly 220 E1 SEW07004031 3								

[1] Note on special approvals
[2] Oil type
[3] Ambient temperature range
[4] Standard

Lubricant table for W.. gear units

The lubricant table is valid on the day this document is published. Refer to **www.sew-eurodrive.de/lubricants** for the latest tables.

Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seals" (→ 🗎 190).

W.. HW..	[3] °C -50 0 +50 +100	[4]	[1]	[2]	ISO,SAE NLGI	SEW EURODRIVE	bremer & leguil	Castrol	FUCHS	Mobil	KLÜBER LUBRICATION	Shell	SINOPEC	TOTAL
	+60	–20	Ex	CLP PG (PSS)	VG 460	-20 | +115 GearOil Poly 460 W E1 SEW07004031 3								
	+60	–20	Ex	CLP PG NSF H1 (PSS)	VG 460	-20 | +115 GearOil Poly 460 H1 E1 SEW07004031 3					-20 | +115 Klübersynth UH1 6-460			
	+20	–30	Ex	CLP PG NSF H1 (PSS)	VG 150 [1]	-30 | +65 GearOil Poly 150 H1 E1 SEW07004031 3					-30 | +65 Klübersynth UH1 6-150			
	+10	–40	Ex	API GL5	SAE 75W90 (~VG 100)					-40 | +65 Mobil Synthetic Gear Oil 75 W90				

[1] Information regarding special approvals
[2] Oil type
[3] Ambient temperature range
[4] Standard

The lubricant table is valid on the day this document is published. Refer to **www.sew-eurodrive.de/lubricants** for the latest tables.

Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seals" (→ 190).

W.9	[4] °C -50 0 +50 +100 [3]	[1]	[2]	ISO,SAE NLGI	SEW EURODRIVE	bremer & leguil	Castrol	FUCHS	Mobil	KLÜBER LUBRICATION	Shell	SINOPEC	TOTAL
	–25 +60		CLP PG (PSS)	VG 220	-25 +100 GearOil Poly 220 E1 SEW07004031					-25 +100 Klübersynth GH 6-220			
	–20 +80			VG 460	-20 +115 GearOil Poly 460 E1 SEW07004031					-20 +115 Klübersynth GH 6-460			
	–30 +40			VG 150	-30 +85 GearOil Poly 150 H1 E1 SEW07004031					-30 +85 Klübersynth GH 6-150			
	–25 +60		CLP PG FPCF (PSS)	VG 220	-25 +100 GearFluid Poly 220 E1 SEW07004031								
	[4] –25 +40		CLP PG NSF H1 (PSS)	VG 220	-25 +80 GearOil Poly 220 H1 E1 SEW07004031					-25 +80 Klübersynth UH 6-220			
	–20 +70			VG 460	-20 +110 GearOil Poly 460 H1 E1 SEW07004031					-20 +110 Klübersynth UH 6-460			
	–30 +20			VG 150	-30 +65 GearOil Poly 150 H1 E1 SEW07004031					-30 +65 Klübersynth UH 6-150			

[1] Information regarding special approvals
[2] Oil type
[3] Ambient temperature range
[4] Standard

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8.2.3 Lubricant fill quantities

INFORMATION

The specified fill quantities are **guide values**. The exact values vary depending on the number of gear stages and the gear ratio. Always check the oil level plug during filling for the exact oil quantity.

INFORMATION

Unless a special arrangement is made, SEW-EURODRIVE supplies the drives with a lubricant fill adapted for the specific mounting position. The mounting position (see chapter "Designation of the mounting positions" (→ 🗎 145)) must therefore be specified in the drive order.

When the mounting position is changed, the lubricant fill quantity must be adapted accordingly (see the following chapters). Consequently, a mounting position may only be **changed** after consultation with SEW-EURODRIVE; **otherwise your rights to claim under limited warranty no longer apply.**

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Helical (R) gear units

R.., R..F

Gear unit	Fill quantity in liters					
	M1[1)]	M2[1)]	M3[1)]	M4	M5	M6
R07	0.12	0.20				
R17	0.25	0.55	0.35	0.55	0.35	0.40
R27	0.25/0.40	0.70	0.50	0.70	0.50	
R37	0.30/0.95	0.85	0.95	1.05	0.75	0.95
R47	0.70/1.50	1.60	1.50	1.65	1.50	
R57	0.80/1.70	1.90	1.70	2.10	1.70	
R67	1.10/2.30	2.40	2.80	2.90	1.80	2.00
R77	1.20/3.00	3.30	3.60	3.80	2.50	3.40
R87	2.30/6.0	6.5/8.1	7.4/7.2	7.4	6.4	6.6
R97	4.60/9.8	11.7		13.4	11.3	11.7
R107	6.0/13.7	16.3	16.9	19.2	13.2	15.9
R127	6.4/17	18.3	18.2	22.0	16.8	17.9
R137	10.0/25.0	28.0	29.5	31.5	25.0	
R147	15.4/40.0	46.5	48.0	52.0	39.5	41.0
R167	27.0/70.0	82.0	78.0	88.0	66.0	69.0

1) The larger gear unit of compound gear units must be filled with the larger oil quantity.

RF.., RM.., RZ..

Gear unit	Fill quantity in liters					
	M1[1)]	M2[1)]	M3	M4	M5	M6
RF07	0.12	0.20				
RF17	0.25	0.55	0.35	0.55	0.35	0.40
RF27	0.25/0.40	0.70	0.50	0.70	0.50	
RF37	0.35/0.95	0.90	0.95	1.05	0.75	0.95
RF47	0.65/1.50	1.60	1.50	1.65	1.50	
RF57	0.80/1.70	1.80	1.70	2.00	1.70	
RF67	1.20/2.50	2.50/3.2	2.70	2.80	1.90	2.10
RF77	1.20/2.60	3.10/4.0	3.30	3.60	2.40	3.00
RF87	2.40/6.0	6.5/8.2	7.3	7.4	6.4	6.5
RF97	5.1/10.2	11.9	11.2	14.0	11.2	11.8
RF107	6.3/14.9	15.9	17.0	19.2	13.1	15.9
RF127	6.6/16.0	18.3	18.2	21.4	15.9	17.0
RF137	9.5/25.0	27.0	29.0	32.5	25.0	
RF147	16.4/42.0	47.0	48.0	52.0	42.0	
RF167	26.0/70.0	82.0	78.0	88.0	65.0	71.0

1) The larger gear unit of compound gear units must be filled with the larger oil quantity.

RX..

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
RX57	0.60	0.80	1.30		0.90	
RX67	0.80		1.70	1.40	1.10	
RX77	1.10	1.50	2.60	2.70	1.60	
RX87	1.70	2.50	4.80		2.90	
RX97	2.10	3.40	7.4	7.0	4.80	
RX107	3.90	5.6	11.6	11.9	7.7	

RXF..

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
RXF57	0.50	0.80	1.10		0.70	
RXF67	0.70	0.80	1.50	1.40	1.00	

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Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
RXF77	0.90	1.30	2.40	2.00	1.60	
RXF87	1.60	1.95	4.90	3.95	2.90	
RXF97	2.10	3.70	7.1	6.3	4.80	
RXF107	3.10	5.7	11.2	9.3	7.2	

Parallel shaft helical (F) gear units

F.., FA..B, FH..B, FV..B

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
F..27	0.60	0.80	0.65	0.70	0.60	
F..37	0.95	1.25	0.70	1.25	1.00	1.10
F..47	1.50	1.80	1.10	1.90	1.50	1.70
F..57	2.25	3.15	1.65	3.15	2.40	2.50
F..67	2.70	3.80	1.90	3.80	2.90	3.20
F..77	5.90	7.30	4.30	8.00	6.00	6.30
F..87	11.0	13.1	7.70	14.0	10.9	11.1
F..97	18.8	22.7	12.6	25.5	18.6	20.2
F..107	24.5	32.0	19.5	37.5	27.0	
F..127	40.5	54.5	34.0	61.0	46.3	47.0
F..157	74.0	106.5	63.0	110.0	88.5	80.5

FF..

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
FF27	0.60	0.80	0.65	0.70	0.60	
FF37	1.00	1.25	0.70	1.30	1.00	1.10
FF47	1.60	1.85	1.10	1.90	1.50	1.70
FF57	2.30	3.05	1.70	3.10	2.30	2.40
FF67	2.70	3.80	1.90	3.80	2.90	3.20
FF77	5.90	7.30	4.30	8.10	6.00	6.30
FF87	11.0	13.3	7.80	14.3	11.1	11.3
FF97	19.3	22.7	12.6	25.9	19.0	20.7
FF107	25.5	32.0	19.5	38.5	18.6	28.0
FF127	41.5	55.5	34.0	63.0	45.0	49.0
FF157	77.0	107.5	64.0	111.0	89.5	81.5

FA.., FH.., FV.., FAF.., FAZ.., FHF.., FZ.., FHZ.., FVF.., FVZ.., FT.., FM.., FAM..

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
F..27	0.60	0.80	0.65	0.70	0.60	
F..37	0.95	1.25	0.70	1.25	1.00	1.10
F..47	1.50	1.80	1.10	1.90	1.50	1.70
F..57	2.40	3.10	1.70	3.15	2.40	2.50
F..67	2.70	3.80	1.90	3.80	2.90	3.20
F..77	5.90	7.30	4.30	8.00	6.00	6.30
F..87	11.0	13.1	7.70	14.0	10.9	11.1
F..97	18.8	22.7	12.6	25.5	18.6	20.2
F..107	24.5	32.0	19.5	37.5	27.0	
F..127	39.0	54.5	34.0	61.0	45.0	46.5
F..157	73.0	105.5	62.0	109.0	87.5	79.5

Helical-bevel (K) gear units

INFORMATION

All K..19 and K..29 gear units have a universal mounting position, which means that K..19 and K..29 gear units of the same design are filled with the same oil quantity independent of the mounting position. An exception to this is the M4 mounting position.

K.., KA..B, KH..B, KV..B

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
K..19	0.40			0.45	0.40	
K..29	0.70			0.85	0.70	
K..39	0.86	1.65	1.55	2.10	1.55	1.30
K..49	1.65	3.35	2.80	4.20	3.15	2.75
K..37	0.50	1.00		1.25	0.95	
K..47	0.80	1.30	1.50	2.00	1.60	
K..57	1.10	2.20		2.80	2.30	2.10
K..67	1.10	2.40	2.60	3.45	2.60	
K..77	2.20	4.10	4.40	5.80	4.20	4.40
K..87	3.70	8.20	8.90	10.90	8.20	
K..97	7.0	14.0	15.70	20.0	15.70	15.50
K..107	10.0	21.0	25.50	33.50	24.0	
K..127	19.0	41.50	44.0	54.0	40.0	41.0
K..157	31.0	65.0	68.0	90.0	62.0	63.0
K..167	33.0	97.0	109.0	127.0	89.0	86.0
K..187	53.0	156.0	174.0	207.0	150.0	147.0

KF..

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
KF19	0.40			0.45	0.40	
KF29	0.70			0.85	0.70	
KF39	0.86	1.65	1.55	2.10	1.55	1.30
KF49	1.65	3.35	2.80	4.20	3.15	2.75
KF37	0.50	1.10		1.40	1.00	
KF47	0.80	1.30	1.70	2.20	1.60	
KF57	1.20	2.20	2.40	3.15	2.50	2.30
KF67	1.10	2.40	2.80	3.70	2.70	
KF77	2.10	4.10	4.40	5.90	4.50	
KF87	3.70	8.30	9.2	11.90	8.60	8.50
KF97	7.0	14.70	17.30	21.50	15.70	16.50
KF107	10.0	21.90	26.0	35.10	25.40	25.30
KF127	19.0	41.50	46.0	55.0	41.0	
KF157	31.0	66.0	69.0	92.0	63.0	

KA.., KH.., KV.., KAF.., KHF.., KVF.., KZ.., KAZ.., KHZ.., KVZ.., KT.., KM.., KAM..

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
K..19	0.40			0.45	0.40	
K..29	0.70			0.85	0.70	
K..39	0.86	1.65	1.55	2.10	1.55	1.30
K..49	1.65	3.35	2.80	4.20	3.15	2.75
K..37	0.50	1.00		1.30	1.00	
K..47	0.80	1.30	1.60	2.0	1.60	
K..57	1.20	2.20	2.40	3.15	2.70	2.40

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Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
K..67	1.10	2.40	2.70	3.70	2.60	
K..77	2.10	4.10	4.60	5.90	4.40	
K..87	3.70	8.40	9.0	11.10	8.2	
K..97	7.0	14.70	15.70	20.0	15.70	
K..107	10.0	20.80	24.5	32.4	24.5	24.3
K..127	19.0	41.50	43.0	52.0	40.0	
K..157	31.0	65.0	68.0	90.0	62.0	63.0
K..167	33.0	97.0	109.0	127.0	89.0	86.0
K..187	53.0	156.0	174.0	207.0	150.0	147.0

Helical-worm (S) gear units

S..

Gear unit	Fill quantity in liters					
	M1	M2	M3[1)]	M4	M5	M6
S37	0.25	0.40	0.50	0.55	0.40	
S47	0.35	0.80	0.70/0.90	1.00	0.80	
S57	0.50	1.20	1.00/1.20	1.35	1.30	
S67	1.00	2.00	2.20/3.10	3.10	2.60	2.60
S77	1.90	4.20	3.70/5.4	5.9	4.40	
S87	3.30	8.1	6.9/10.4	11.3	8.4	
S97	6.8	15.0	13.4/18.0	21.8	17.0	

1) The larger gear unit of compound gear units must be filled with the larger oil quantity.

SF..

Gear unit	Fill quantity in liters										
	M1	M2	M3[1)]	M4 Output		M5 Output			M6 Output		
				A/B	A + B	A	B	A + B	A	B	A + B
SF37	0.25	0.40	0.50	0.55	0.6	0.4	0.4	0.4	0.4	0.4	0.4
SF47	0.40	0.90	0.90/1.05	1.10	1.15	1.0	0.9	1.0	0.9	1.0	1.0
SF57	0.50	1.20	1.00/1.50	1.50	1.55	1.4	1.4	1.4	1.4	1.4	1.4
SF67	1.00	2.20	2.30/3.00	3.20	3.5	2.7	2.6	2.7	2.6	2.7	2.7
SF77	1.90	4.10	3.90/5.8	6.5	7.2	4.9	4.6	4.9	4.6	4.9	4.9
SF87	3.80	8.0	7.1/10.1	12.0	13.2	9.1	8.2	9.1	8.2	9.1	9.1
SF97	7.4	15.0	13.8/18.8	23.1	25.2	18.0	17.0	18.0	17.0	18.0	18.0

1) The larger gear unit of compound gear units must be filled with the larger oil quantity.

SA.., SH.., SAF.., SHZ.., SAZ.., SHF.., ST..

Gear unit	Fill quantity in liters					
	M1	M2	M3[1)]	M4	M5	M6
S..37	0.25	0.40	0.50		0.40	
S..47	0.40	0.80	0.70/0.90	1.05	0.80	
S..57	0.50	1.10	1.00/1.50	1.45	1.20	
S..67	1.00	2.00	1.80/2.60	2.90	2.50	
S..77	1.80	3.90	3.60/5.0	5.8	4.50	
S..87	3.80	7.4	6.0/8.7	10.8	8.0	
S..97	7.0	14.0	11.4/16.0	21.0	15.7	

1) The larger gear unit of compound gear units must be filled with the larger oil quantity.

SPIROPLAN® (W) gear units

INFORMATION

SPIROPLAN® W..10 to W..30 gear units have a universal mounting position, which means that gear units of the same design are filled with the same oil quantity independent of the mounting position.

The oil fill quantity of SPIROPLAN® W..37 and W..47 gear units in mounting position M4 is different from that of the other mounting positions.

W.., WA..B, WH..B

Gear unit	Fill quantity in liters						
	M1	M2	M3	M4		M5	M6
				2	3		
W10	0.16						
W20	0.24						
W30	0.40						
W37	0.50			0.70		0.50	
W47	0.90			1.40		0.90	

WF..

Gear unit	Fill quantity in liters						
	M1	M2	M3	M4		M5	M6
				2	3		
WF10	0.16						
WF19	0.34			0.6	0.54	0.54	
WF20	0.24						
WF30	0.40						
WF37	0.50			0.70		0.50	
WF47	0.90			1.55		0.90	
WF29	0.54			0.93	0.78	0.84	
WF39	0.85			1.5	1.35	1.25	
WF49	1.39			2.41	2.19	2.15	
WF59	2.0			3.49	3.2	3.0	

WA.., WAF..,WH.., WT.., WHF..

Gear unit	Fill quantity in liters						
	M1	M2	M3	M4		M5	M6
				2	3		
W..10	0.16						
W..19	0.34			0.6	0.54	0.54	
W..20	0.24						
W..30	0.40						
W..37	0.50			0.70		0.50	
W..47	0.80			1.40		0.80	
W..29	0.54			0.93	0.78	0.84	
W..39	0.85			1.5	1.35	1.25	
W..49	1.39			2.41	2.19	2.15	
W..59	2.0			3.49	3.2	3.0	

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9 Malfunctions and remedies

⚠ WARNING

Risk of death or injury if the drive starts up unintentionally.

Severe or fatal injuries.

- De-energize the motor before you start working on the unit.
- Secure the motor against unintended power-up.

⚠ CAUTION

Risk of burns due to hot gear unit and hot gear unit oil.

Severe injuries.

- Let the gear unit cool down before you start working on it.
- Carefully remove the oil level plug and the oil drain plug.

NOTICE

Damage to gear unit/gearmotor due to improper operation.

Damage to the gear unit/gearmotor.

- Repair works at SEW-EURODRIVE gear units may only be performed by qualified specialists. In the context of this documentation, qualified specialists are persons who are familiar with the "Technical regulations on operating safety" (TRBS).
- Drive and motor may only be disconnected by qualified specialists.
- Contact SEW-EURODRIVE.

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9.1 Gear units

Fault	Possible cause	Measure
Unusual, regular running noise	• Meshing/grinding noise: Bearing damage	• Check the oil consistency; change bearings
	• Knocking noise: Irregularity in the gearing	• Contact SEW-EURODRIVE. For a better assessment of the failure, send an audio recording of the noise
	• Deformation of the housing upon tightening	• Check the gear unit mounting for possible deformation and correct if necessary
	• Noise generation caused by insufficient rigidity of the gear unit foundation	• Reinforce the gear unit foundation
Unusual, irregular running noises	• Foreign objects in the oil	• Check the oil consistency • Stop the drive, contact SEW-EURODRIVE
Oil leaking from gear unit cover	• Seal of the gear unit cover leaking	• Tighten the screws of the gear unit cover and observe the gear unit. Contact SEW-EURODRIVE if oil is still leaking
	• Seal defective	• Contact SEW-EURODRIVE
Small amounts of oil leak from the oil seal during run-in phase.	• Function-related pseudo-leakage	• There is no failure. Remove with a soft, lint-free cloth and keep monitoring it.
Film of moisture around the dust lip of the oil seal	• Function-related pseudo-leakage	• There is no failure. Remove with a soft, lint-free cloth and keep monitoring it.
Oil leaking from oil seal	• Oil seal leaking/defective	• Check sealing system. It may be necessary to consult SEW-EURODRIVE
Oil leaking from motor (e.g. terminal box or fan)	• Too much oil	• Check oil level, correct if necessary
	• Gear unit not ventilated	• Vent gear unit
	• Oil seal leaking/defective	• Check sealing system. It may be necessary to consult SEW-EURODRIVE
Oil leaking from flange	• Flange gasket leaking/defective	• Check sealing system. It may be necessary to consult SEW-EURODRIVE
	• Too much oil	• Check oil level, correct if necessary
	• Gear unit not ventilated	• Vent gear unit
Oil emerging from breather valve	• Too much oil	• Check oil quantity, correct if necessary
	• Function-related oil mist	• There is no failure.
	• Drive not installed in proper mounting position	• Install breather valve correctly and adjust the oil level.
	• Frequent cold starts (oil foams) and/or high oil level	• Install oil expansion tank

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Fault	Possible cause	Measure
Output shaft does not turn although the motor is running or the input shaft is rotated	• Shaft-hub connection in the gear unit interrupted	• Send in the gear unit/gearmotor for repair

9.2 AMS../AQS../AL../EWH.. adapter

Fault	Possible cause	Measure
Unusual, regular running noise	• Meshing/grinding noise: Bearing damage	• Contact SEW-EURODRIVE
Oil leaking	• Seal defective	• Contact SEW-EURODRIVE
Output shaft does not turn although the motor is running or the input shaft is rotated	• Shaft-hub connection in the gear unit interrupted	• Send in the gear unit/gearmotor for repair
Change in running noise and/or vibrations	• Coupling ring wear, short-term torque transmission due to metal contact	• Replace coupling ring.
	• Screws to secure hub axially are loose	• Tighten the screws
Premature coupling ring wear	• Contact with aggressive fluids/ oils; ozone influence; excessive ambient temperatures, etc. that can change the physical properties of the coupling ring.	• Contact SEW-EURODRIVE
	• Non-permissibly high coupling ring ambient/contact temperatures; max. permissible: -20 °C to +80 °C.	• Contact SEW-EURODRIVE
	• Overload	• Contact SEW-EURODRIVE

9.3 AD input shaft assembly

Fault	Possible cause	Measure
Unusual, regular running noise	• Meshing/grinding noise: Bearing damage	• Contact SEW-EURODRIVE
Oil leaking	• Seal defective	• Contact SEW-EURODRIVE
Output shaft does not turn although the input shaft is rotated	• Connection between shaft and hub in gear unit or cover interrupted.	• Send the gear unit to SEW-EURODRIVE for repair.

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9.4 Service

If you require customer service, include the following information:

- Nameplate data (complete)
- Type and extent of the failure
- Time the failure occurred and any accompanying circumstances
- Assumed cause
- A digital picture of the failure, if possible

9.5 Waste disposal

Dispose of gear units in accordance with the material structure and the regulations in force:

- As scrap steel/stainless steel
  - Housing parts
  - Gear wheels
  - Shafts
  - Rolling bearings
- Parts of the worm gears are made of non-ferrous metals. Dispose of the worm gear accordingly.
- Collect used oil and dispose of it according to the regulations in force.

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10 Address list

Argentina			
Assembly Sales	Buenos Aires	SEW EURODRIVE ARGENTINA S.A. Ruta Panamericana Km 37.5, Lote 35 (B1619IEA) Centro Industrial Garín Prov. de Buenos Aires	Tel. +54 3327 4572-84 Fax +54 3327 4572-21 http://www.sew-eurodrive.com.ar sewar@sew-eurodrive.com.ar
Australia			
Assembly Sales Service	Melbourne	SEW-EURODRIVE PTY. LTD. 27 Beverage Drive Tullamarine, Victoria 3043	Tel. +61 3 9933-1000 Fax +61 3 9933-1003 http://www.sew-eurodrive.com.au enquires@sew-eurodrive.com.au
	Sydney	SEW-EURODRIVE PTY. LTD. 9, Sleigh Place, Wetherill Park New South Wales, 2164	Tel. +61 2 9725-9900 Fax +61 2 9725-9905 enquires@sew-eurodrive.com.au
Austria			
Assembly Sales Service	Vienna	SEW-EURODRIVE Ges.m.b.H. Richard-Strauss-Straße 24 1230 Wien	Tel. +43 1 617 55 00-0 Fax +43 1 617 55 00-30 http://www.sew-eurodrive.at sew@sew-eurodrive.at
Bangladesh			
Sales	Bangladesh	SEW-EURODRIVE INDIA PRIVATE LIMITED 345 DIT Road East Rampura Dhaka-1219, Bangladesh	Tel. +88 01729 097309 salesdhaka@seweurodrivebangladesh.com
Belarus			
Sales	Minsk	Foreign unitary production enterprise SEW-EURODRIVE Novodvorskij village council 145 223016, Minsk region	Tel. +375 17 319 47 56 / +375 17 378 47 58 Fax +375 17 378 47 54 http://www.sew-eurodrive.by sew@sew-eurodrive.by
Belgium			
Assembly Sales Service	Brussels	SEW-EURODRIVE n.v./s.a. Researchpark Haasrode 1060 Evenementenlaan 7 3001 Leuven	Tel. +32 16 386-311 Fax +32 16 386-336 http://www.sew-eurodrive.be info@sew-eurodrive.be
Service Competence Center	Industrial Gears	SEW-EURODRIVE n.v./s.a. Rue du Parc Industriel, 31 6900 Marche-en-Famenne	Tel. +32 84 219-878 Fax +32 84 219-879 http://www.sew-eurodrive.be info@sew.be
Brazil			
Production Sales Service	São Paulo	SEW-EURODRIVE Brasil Ltda. Estrada Municipal José Rubim, 205 – Rodovia Santos Dumont Km 49 Indaiatuba – 13347-510 – SP	Tel. +55 19 3835-8000 sew@sew.com.br
Assembly Sales Service	Rio Claro	SEW-EURODRIVE Brasil Ltda. Rodovia Washington Luiz, Km 172 Condomínio Industrial Conpark Caixa Postal: 327 13501-600 – Rio Claro / SP	Tel. +55 19 3522-3100 Fax +55 19 3524-6653 montadora.rc@sew.com.br
	Joinville	SEW-EURODRIVE Brasil Ltda. Jvl / Ind Rua Dona Francisca, 12.346 – Pirabeiraba 89239-270 – Joinville / SC	Tel. +55 47 3027-6886 Fax +55 47 3027-6888 filial.sc@sew.com.br
Bulgaria			
Sales	Sofia	BEVER-DRIVE GmbH Bogdanovetz Str.1 1606 Sofia	Tel. +359 2 9151160 Fax +359 2 9151166 bever@bever.bg

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Cameroon			
Sales	Douala	SEW-EURODRIVE SARLU Ancienne Route Bonabéri P.O. Box B.P 8674 Douala-Cameroun	Tel. +237 233 39 12 35 Fax +237 233 39 02 10 www.sew-eurodrive.ci/ info@sew-eurodrive.cm
Canada			
Assembly Sales Service	Toronto	SEW-EURODRIVE CO. OF CANADA LTD. 210 Walker Drive Bramalea, ON L6T 3W1	Tel. +1 905 791-1553 Fax +1 905 791-2999 http://www.sew-eurodrive.ca l.watson@sew-eurodrive.ca
	Vancouver	SEW-EURODRIVE CO. OF CANADA LTD. Tilbury Industrial Park 7188 Honeyman Street Delta, BC V4G 1G1	Tel. +1 604 946-5535 Fax +1 604 946-2513 b.wake@sew-eurodrive.ca
	Montreal	SEW-EURODRIVE CO. OF CANADA LTD. 2001 Ch. de l'Aviation Dorval Quebec H9P 2X6	Tel. +1 514 367-1124 Fax +1 514 367-3677 n.paradis@sew-eurodrive.ca
Chile			
Assembly Sales Service	Santiago de Chile	SEW-EURODRIVE CHILE LTDA Las Encinas 1295 Parque Industrial Valle Grande LAMPA Santiago de Chile P.O. Box Casilla 23 Correo Quilicura - Santiago - Chile	Tel. +56 2 2757 7000 Fax +56 2 2757 7001 http://www.sew-eurodrive.cl ventas@sew-eurodrive.cl
China			
Production Assembly Sales Service	Tianjin	SEW-EURODRIVE (Tianjin) Co., Ltd. No. 78, 13th Avenue, TEDA Tianjin 300457	Tel. +86 22 25322612 Fax +86 22 25323273 http://www.sew-eurodrive.cn info@sew-eurodrive.cn
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	Guangzhou	SEW-EURODRIVE (Guangzhou) Co., Ltd. No. 9, JunDa Road East Section of GETDD Guangzhou 510530	Tel. +86 20 82267890 Fax +86 20 82267922 guangzhou@sew-eurodrive.cn
	Shenyang	SEW-EURODRIVE (Shenyang) Co., Ltd. 10A-2, 6th Road Shenyang Economic Technological Development Area Shenyang, 110141	Tel. +86 24 25382538 Fax +86 24 25382580 shenyang@sew-eurodrive.cn
	Taiyuan	SEW-EURODRIVE (Taiyuan) Co,. Ltd. No.3, HuaZhang Street, TaiYuan Economic & Technical Development Zone ShanXi, 030032	Tel. +86-351-7117520 Fax +86-351-7117522 taiyuan@sew-eurodrive.cn
	Wuhan	SEW-EURODRIVE (Wuhan) Co., Ltd. 10A-2, 6th Road No. 59, the 4th Quanli Road, WEDA 430056 Wuhan	Tel. +86 27 84478388 Fax +86 27 84478389 wuhan@sew-eurodrive.cn
	Xi'An	SEW-EURODRIVE (Xi'An) Co., Ltd. No. 12 Jinye 2nd Road Xi'An High-Technology Industrial Development Zone Xi'An 710065	Tel. +86 29 68686262 Fax +86 29 68686311 xian@sew-eurodrive.cn
Sales Service	Hong Kong	SEW-EURODRIVE LTD. Unit No. 801-806, 8th Floor Hong Leong Industrial Complex No. 4, Wang Kwong Road Kowloon, Hong Kong	Tel. +852 36902200 Fax +852 36902211 contact@sew-eurodrive.hk

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Colombia			
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Croatia			
Sales Service	Zagreb	KOMPEKS d. o. o. Zeleni dol 10 10 000 Zagreb	Tel. +385 1 4613-158 Fax +385 1 4613-158 kompeks@inet.hr
Czech Republic			
Assembly Sales Service	Hostivice	SEW-EURODRIVE CZ s.r.o. Floriánova 2459 253 01 Hostivice	Tel. +420 255 709 601 Fax +420 235 350 613 http://www.sew-eurodrive.cz sew@sew-eurodrive.cz
Denmark			
Assembly Sales Service	Copenhagen	SEW-EURODRIVEA/S Geminivej 28-30 2670 Greve	Tel. +45 43 95 8500 Fax +45 43 9585-09 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk
Service	Vejle	SEW-EURODRIVE A/S Bødkervej 2 7100 Vejle	Tel. +45 43 9585 00 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk
Egypt			
Representation: United Arab Emirates			
Estonia			
Sales	Tallin	ALAS-KUUL AS Loomäe tee 1, Lehmja küla 75306 Rae vald Harjumaa	Tel. +372 6593230 Fax +372 6593231 http://www.alas-kuul.ee info@alas-kuul.ee
Finland			
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Service	Hollola	SEW-EURODRIVE OY Keskikankaantie 21 15860 Hollola	Tel. +358 201 589-300 Fax +358 3 780-6211 http://www.sew-eurodrive.fi sew@sew.fi
	Tornio	SEW-EURODRIVE Oy Lossirannankatu 5 95420 Tornio	Tel. +358 201 589 300 Fax +358 3 780 6211 http://www.sew-eurodrive.fi sew@sew.fi
Production Assembly	Karkkila	SEW Industrial Gears Oy Santasalonkatu 6, PL 8 03620 Karkkila, 03601 Karkkila	Tel. +358 201 589-300 Fax +358 201 589-310 http://www.sew-eurodrive.fi sew@sew.fi
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Production Sales	Haguenau	SEW USOCOME 48-54 route de Soufflenheim B. P. 20185 67506 Haguenau Cedex	Tel. +33 3 88 73 67 00 http://www.usocome.com sew@usocome.com
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	Brumath	SEW USOCOME 1 Rue de Bruxelles 67670 Mommenheim Cedex	Tel. +33 3 88 37 48 00

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	Lyon	SEW USOCOME 75 rue Antoine Condorcet 38090 Vaulx-Milieu	Tel. +33 4 74 99 60 00 dtclyon@usocome.com
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	Paris	SEW USOCOME Zone industrielle 2 rue Denis Papin 77390 Verneuil l'Étang	Tel. +33 1 64 42 40 80 dtcparis@usocome.com

Gabon
Representation: Cameroon

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Production / Precision Gear Units	Bruchsal	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 sew@sew-eurodrive.de
Production	Graben	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 76676 Graben-Neudorf	Tel. +49 7251 75-0 Fax +49 7251-2970
Service Competence Center	Mechanics / Mechatronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 76676 Graben-Neudorf	Tel. +49 7251 75-1710 Fax +49 7251 75-1711 scc-mechanik@sew-eurodrive.de
	Electronics	SEW-EURODRIVE GmbH & Co KG Christian-Pähr-Straße 12 76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 scc-elektronik@sew-eurodrive.de
	MAXOLU-TION® Factory Automation	SEW-EURODRIVE GmbH & Co KG Eisenbahnstraße 11 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 sew@sew-eurodrive.de
Drive Technology Center	North	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Straße 43 30823 Garbsen (Hannover)	Tel. +49 5137 8798-30 Fax +49 5137 8798-55 dtc-nord@sew-eurodrive.de
	East	SEW-EURODRIVE GmbH & Co KG Dänkritzer Weg 1 08393 Meerane (Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-20 dtc-ost@sew-eurodrive.de
	South	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 85551 Kirchheim (München)	Tel. +49 89 909551-21 Fax +49 89 909551-50 dtc-sued@sew-eurodrive.de
	West	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 40764 Langenfeld (Düsseldorf)	Tel. +49 2173 8507-10 Fax +49 2173 8507-50 dtc-west@sew-eurodrive.de
Drive Center	Berlin	SEW-EURODRIVE GmbH & Co KG Alexander-Meißner-Straße 44 12526 Berlin	Tel. +49 306331131-30 Fax +49 306331131-36 dc-berlin@sew-eurodrive.de
	Bremen	SEW-EURODRIVE GmbH & Co KG Allerkai 4 28309 Bremen	Tel. +49 421 33918-10 Fax +49 421 33918-22 tb-bremen@sew-eurodrive.de

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	Saarland	SEW-EURODRIVE GmbH & Co KG Gottlieb-Daimler-Straße 4 66773 Schwalbach Saar – Hülzweiler	Tel. +49 6831 48946 10 Fax +49 6831 48946 13 dc-saarland@sew-eurodrive.de
	Ulm	SEW-EURODRIVE GmbH & Co KG Dieselstraße 18 89160 Dornstadt	Tel. +49 7348 9885-0 Fax +49 7348 9885-90 dc-ulm@sew-eurodrive.de
	Würzburg	SEW-EURODRIVE GmbH & Co KG Nürnbergerstraße 118 97076 Würzburg-Lengfeld	Tel. +49 931 27886-60 Fax +49 931 27886-66 dc-wuerzburg@sew-eurodrive.de
Drive Service Hotline / 24 Hour Service			0 800 SEWHELP 0 800 7394357
Great Britain			
Assembly Sales Service	Normanton	SEW-EURODRIVE Ltd. DeVilliers Way Trident Park Normanton West Yorkshire WF6 1GX	Tel. +44 1924 893-855 Fax +44 1924 893-702 http://www.sew-eurodrive.co.uk info@sew-eurodrive.co.uk
Greece			
Sales	Athens	Christ. Boznos & Son S.A. 12, K. Mavromichali Street P.O. Box 80136 18545 Piraeus	Tel. +30 2 1042 251-34 Fax +30 2 1042 251-59 http://www.boznos.gr info@boznos.gr
Hungary			
Sales Service	Budapest	SEW-EURODRIVE Kft. Csillaghegyí út 13. 1037 Budapest	Tel. +36 1 437 06-58 Fax +36 1 437 06-50 http://www.sew-eurodrive.hu office@sew-eurodrive.hu
Iceland			
Sales	Reykjavik	Varma & Vélaverk ehf. Knarrarvogi 4 104 Reykjavík	Tel. +354 585 1070 Fax +354 585)1071 https://vov.is/ vov@vov.is
India			
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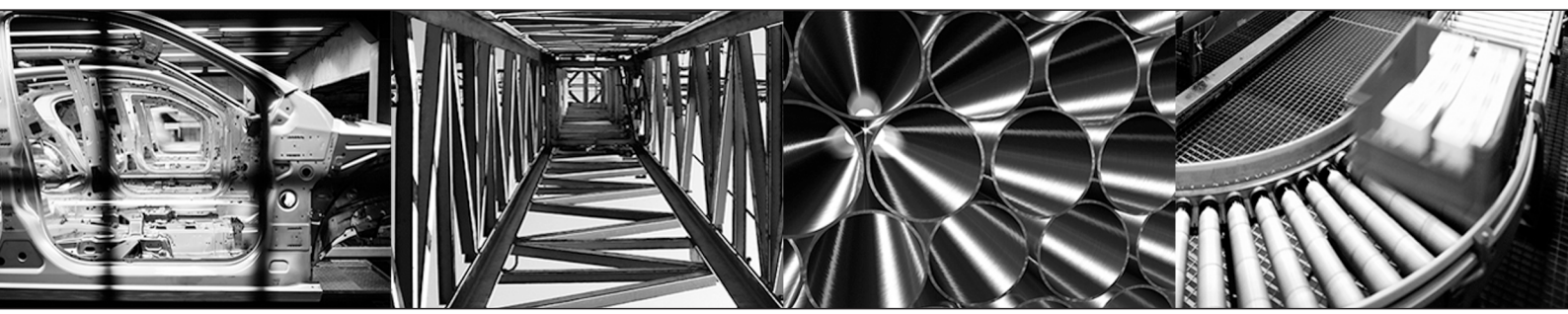

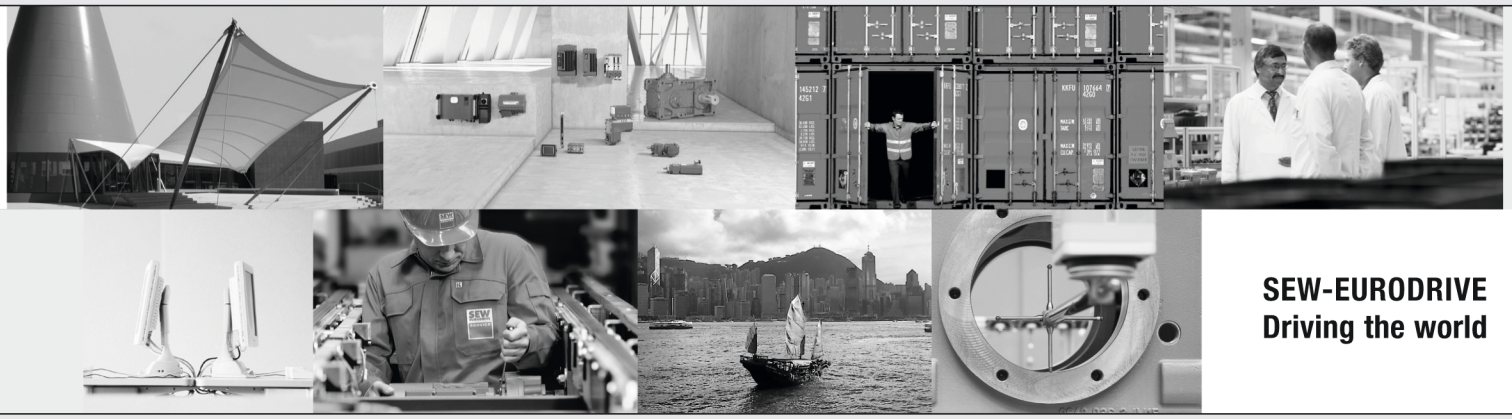

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